CHNOLOGY DEPT.

Gas Journal

VOL. 275. 105TH YEAR. LONDON, JULY 29, 1953. NO. 4704. PRICE 1/3

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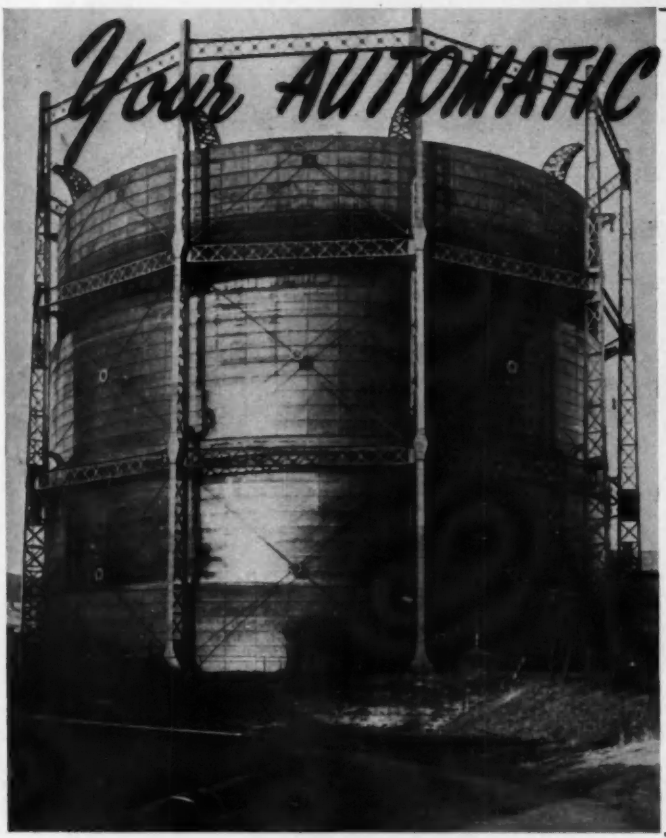

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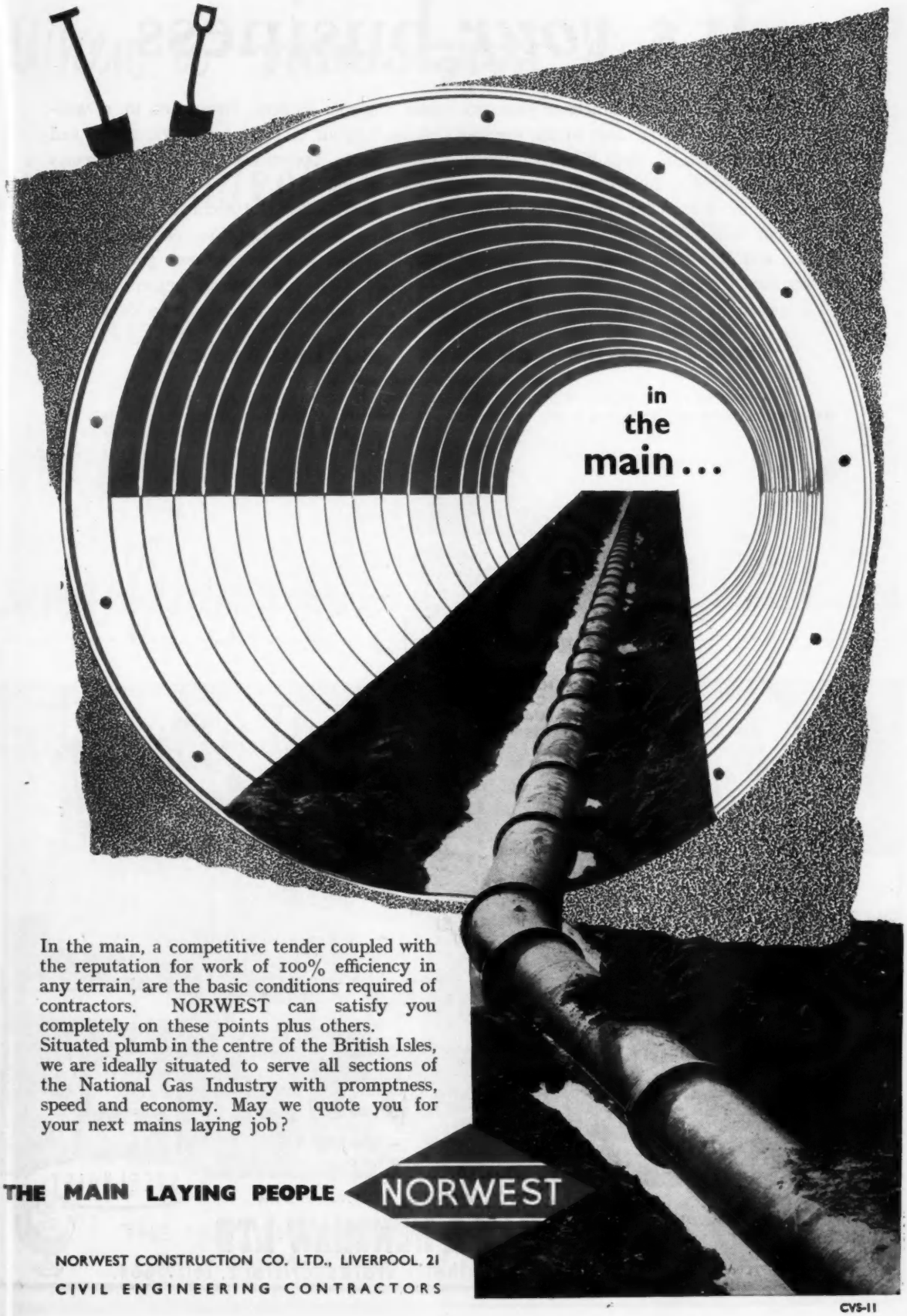

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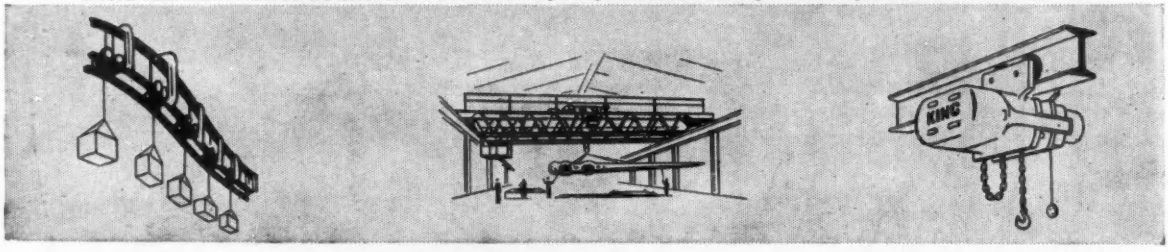

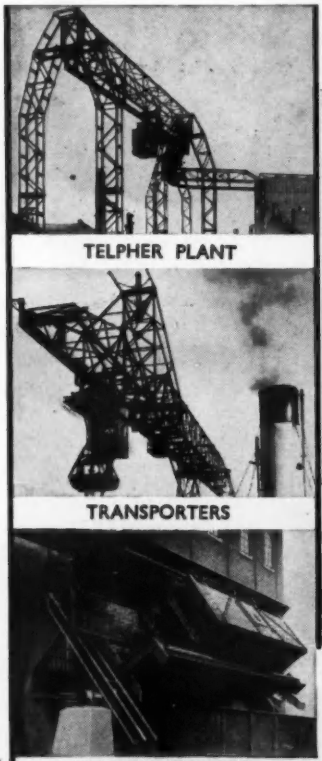

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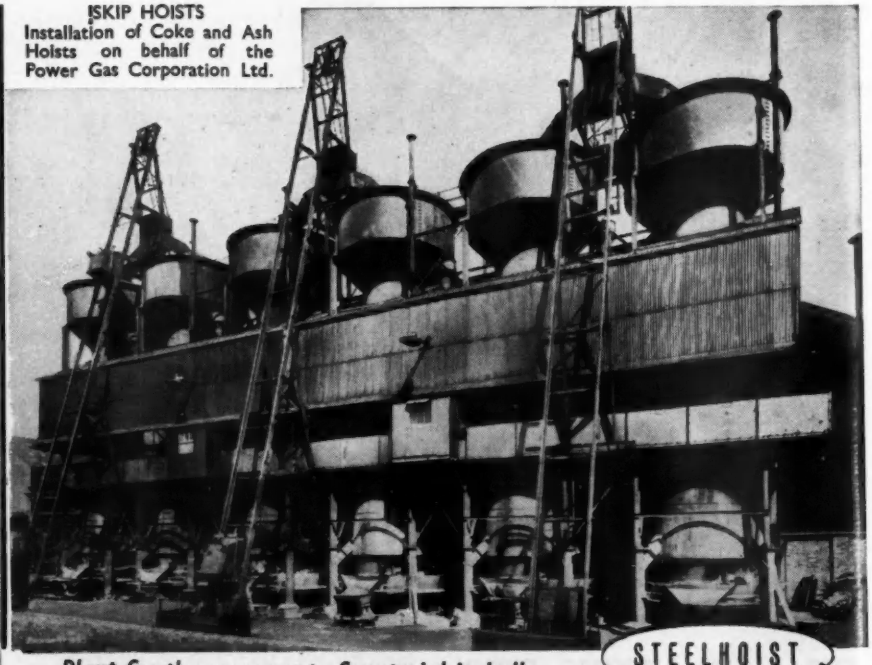
Installation of Coke and Ash Hoists on behalf of the Power Gas Corporation Ltd.



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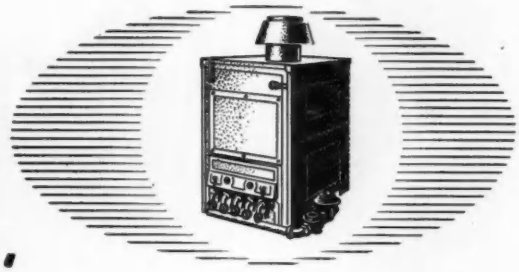

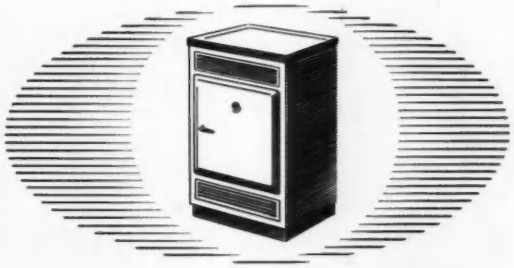

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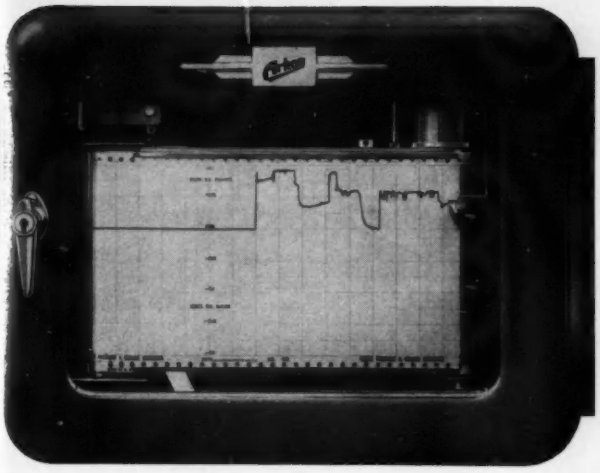

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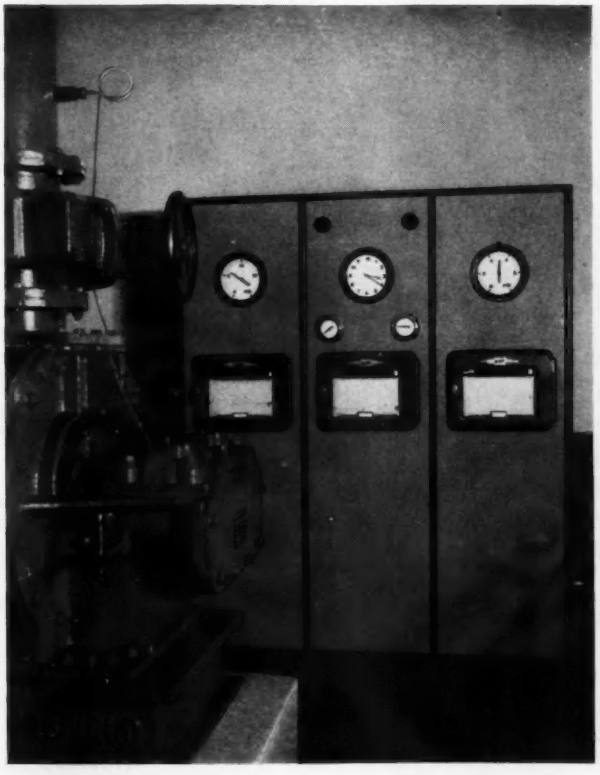

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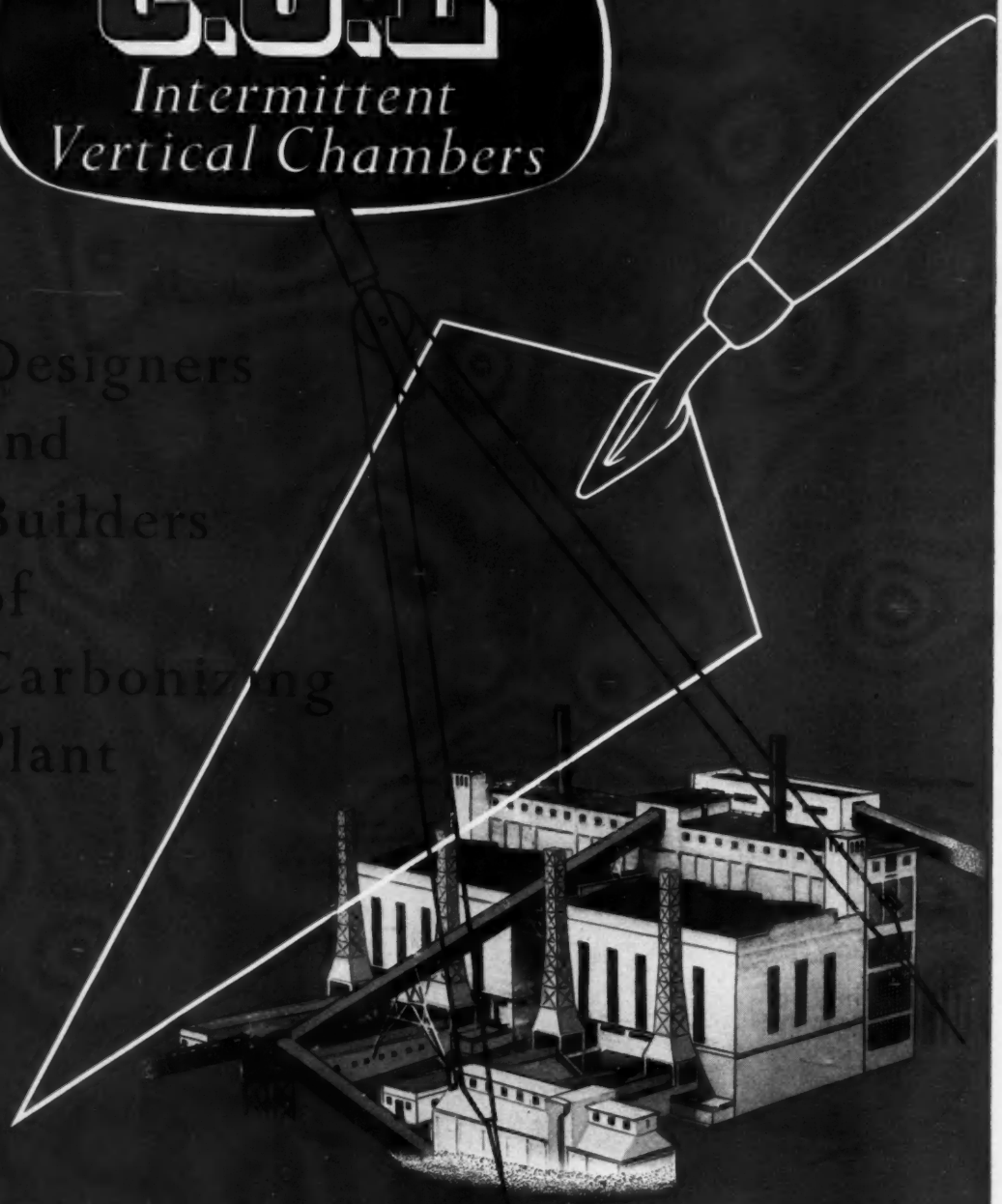

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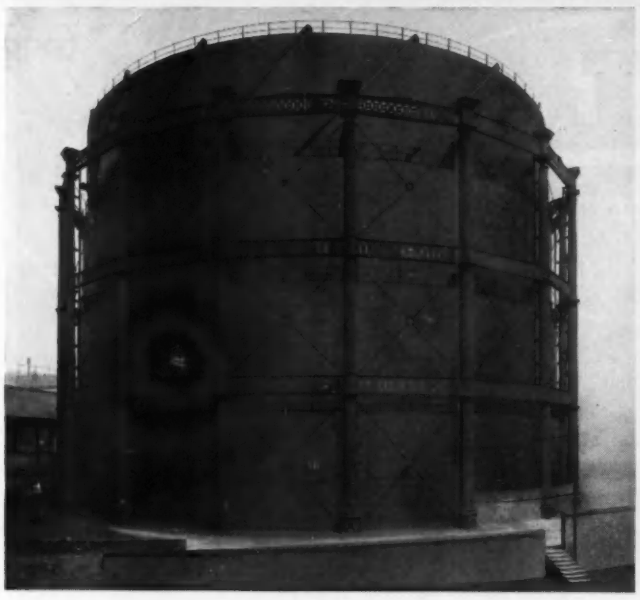

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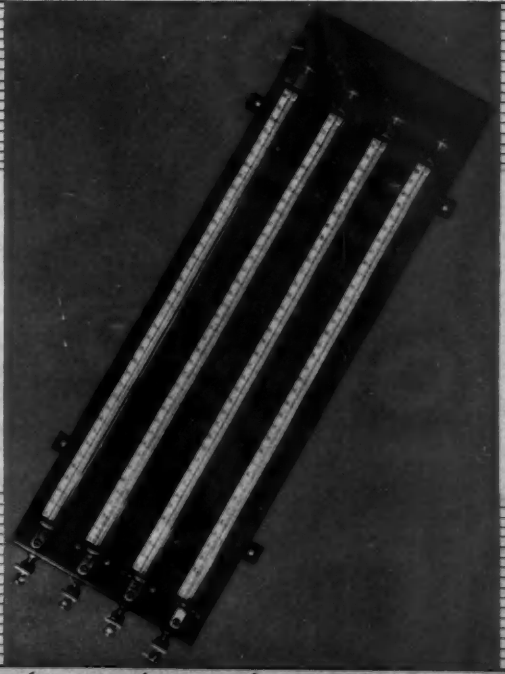

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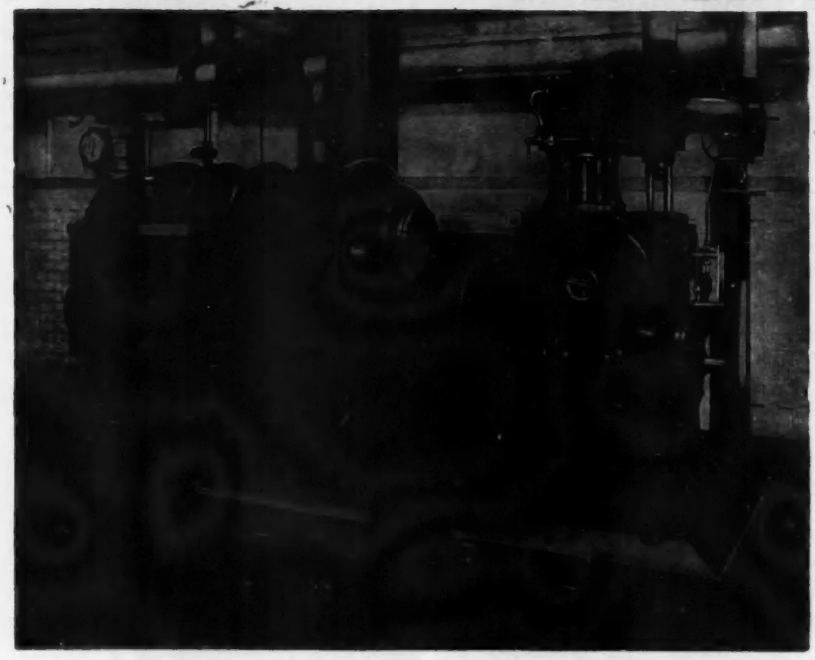

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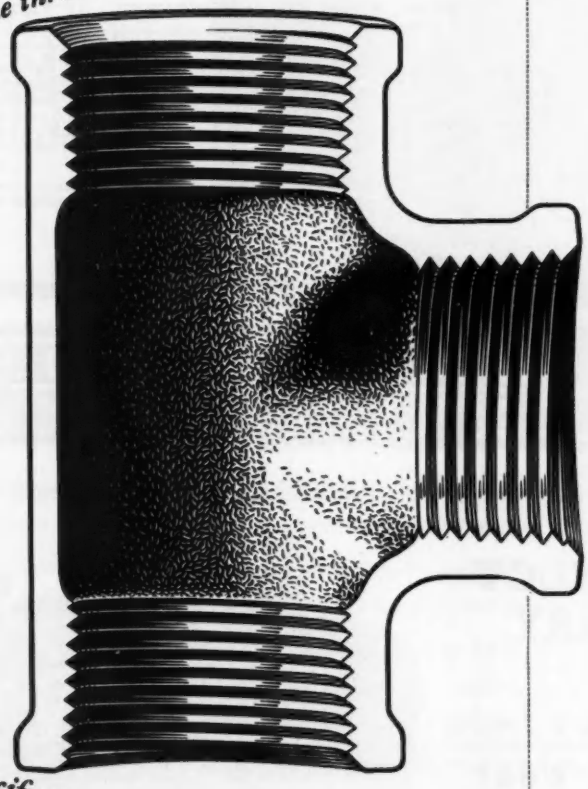

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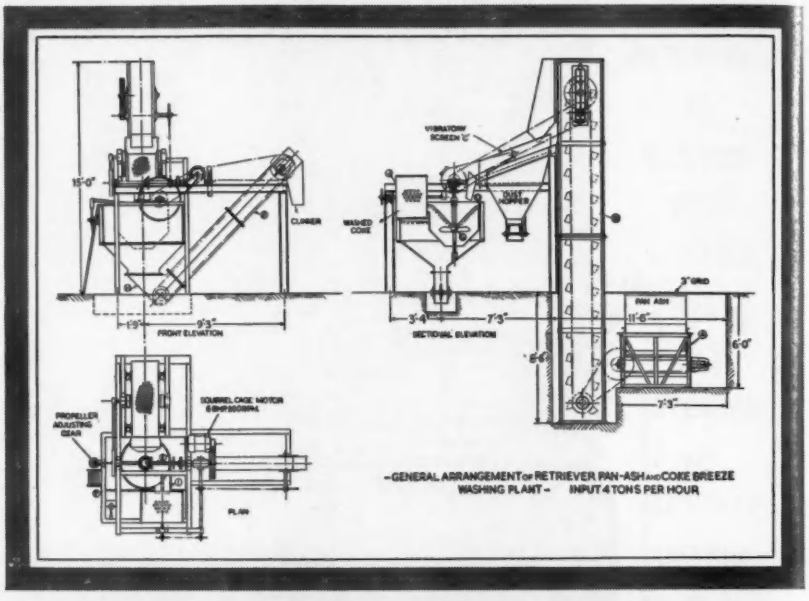

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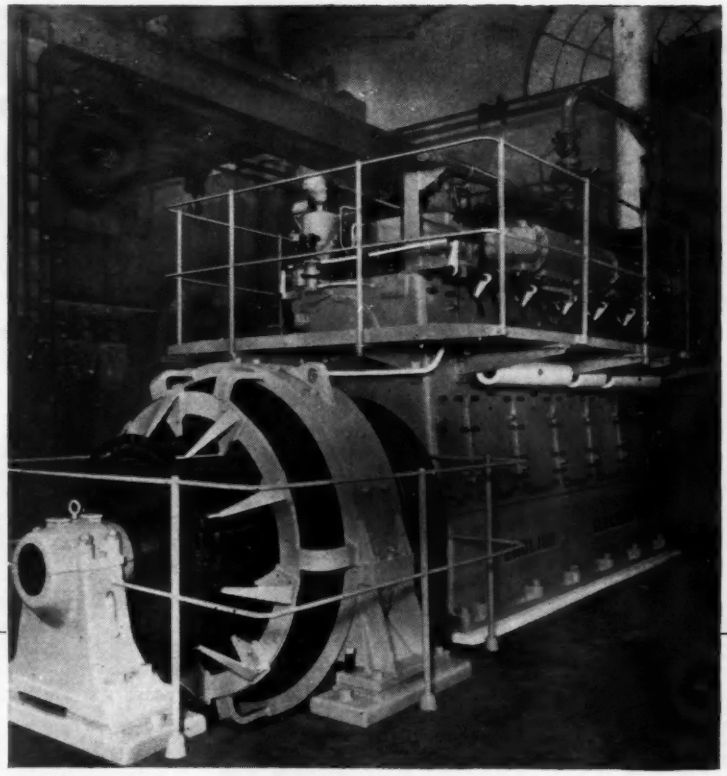

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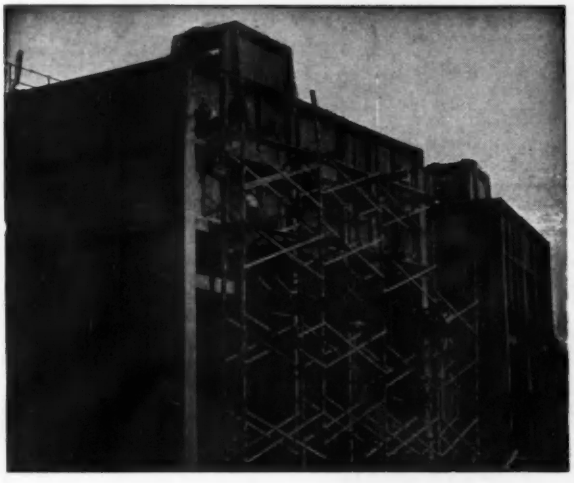
DES. 32

Gunite



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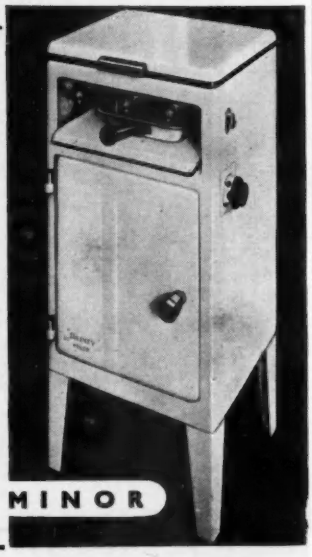

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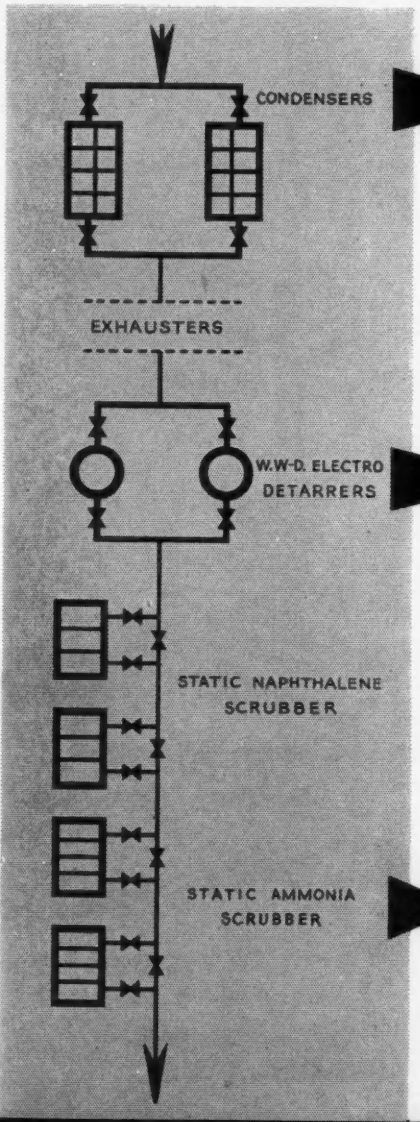

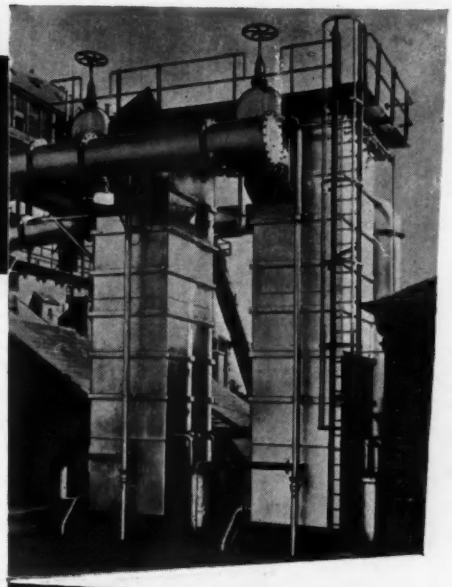

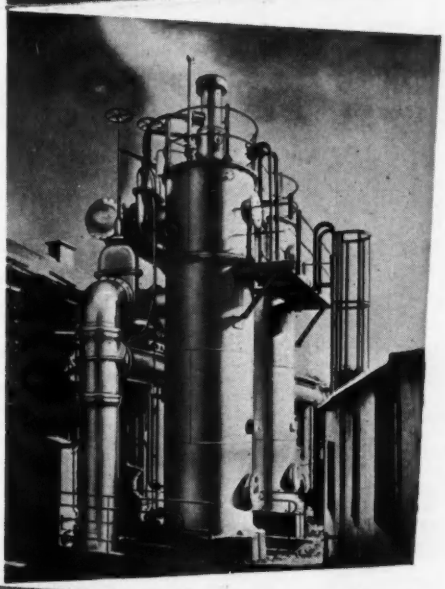

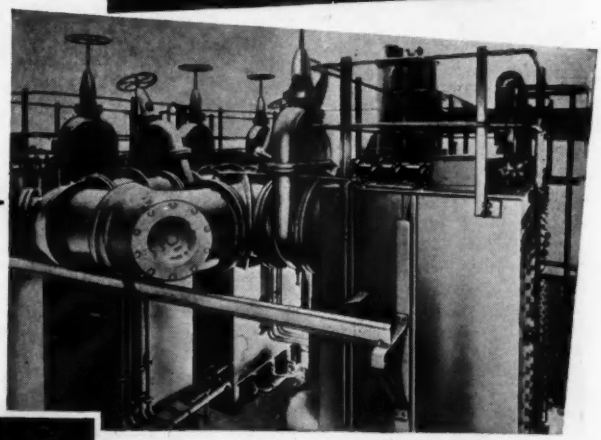

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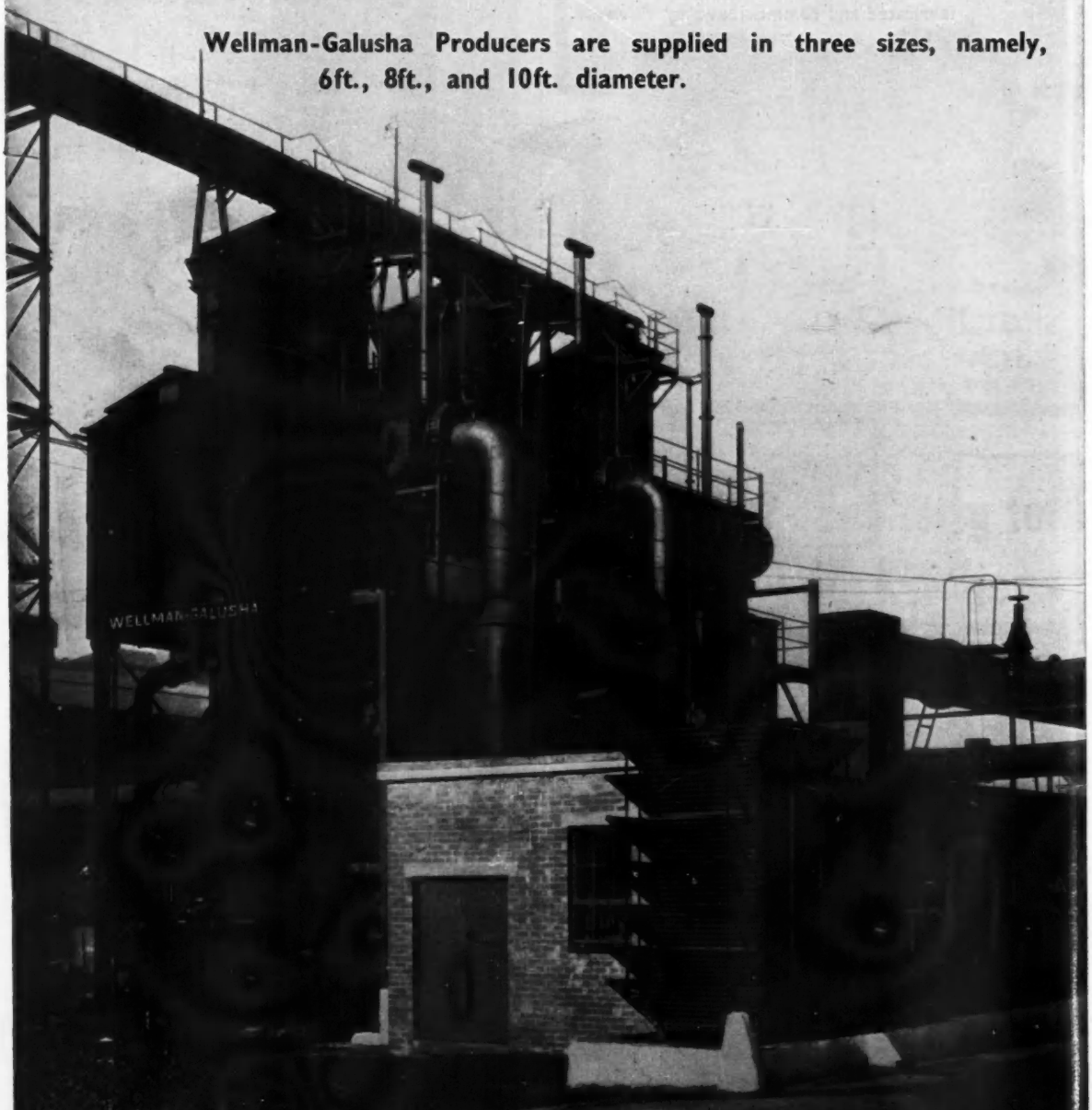

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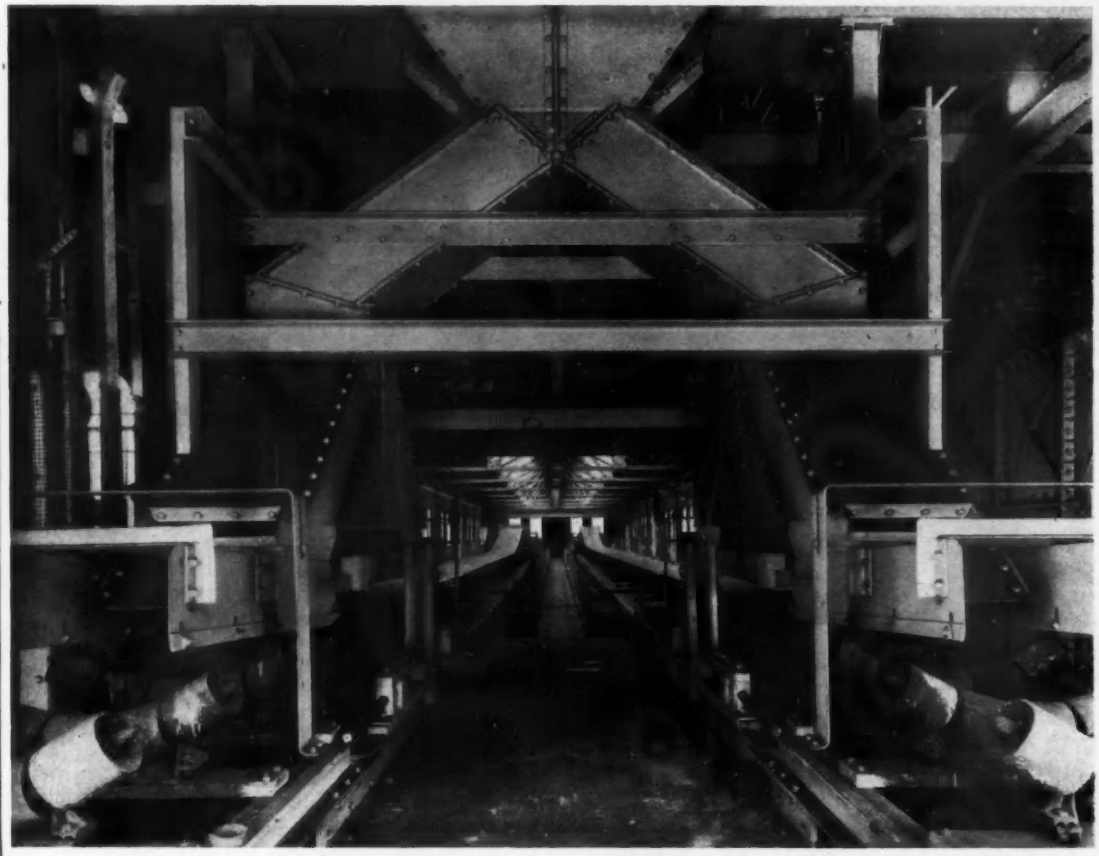

WIGAN—Overhead Coal Belt Conveyors feeding Storage Hoppers on Verticals and showing feed shoots from G.B. Conveyors to all four belt conveyors. The two nearest conveyor belts have been removed to show idlers and tension drums.

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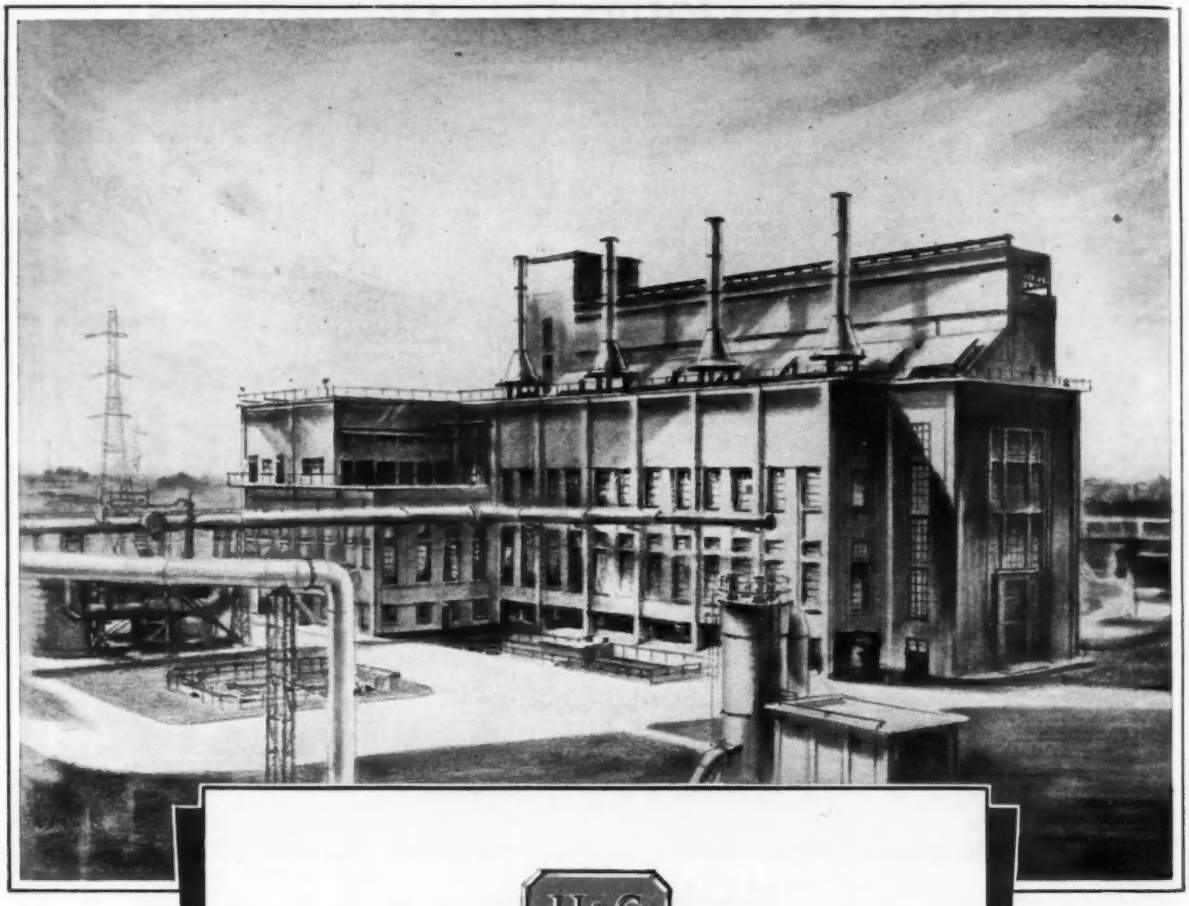
INDEX TO 'JOURNAL' ADVERTISERS

	PAGE
A	
A.C.E. Machinery, Ltd.	
Abbott, Birks & Co., Ltd.	
Accurate Recording Instrument Co.	
Acme Wringers, Ltd.	
Acrogen Co., Ltd.	
Acrograph Co., Ltd.	
Adler & Mackay, Ltd.	
Allan Taylor (Engineers) Ltd.,	
Ascot Gas Water Heaters, Ltd.	
Ascot Gas Water Heaters, Ltd. (F.A. Neat)	
Ashmore, Benson, Pease & Co	
Ashworth, Thos., & Co., Ltd.	302
Aspinall's (Paints), Ltd.	
Associated Lead Manufacturers, Ltd.	
Associated Lead Manufacturers, Ltd. (Rustodian)	
Atlas Preservative Co., Ltd.,	
Autocontrol Boilers Ltd.	
Automatic Telephone & Electric Co., Ltd.	
Automotive Products, Ltd.	
Averill, C. R. Ltd.	
B	
Bale & Church, Ltd.	301
Balfour, Henry, & Co., Ltd.	
Begwaco Meters, Ltd.	
Benham & Sons, Ltd.	
Blakeley Firth, Sons & Co., Ltd.,	252
Bolton's Superheater & Pipe Works, Ltd.	
Booth, John, & Sons (Bolton), Ltd.	
Bratt Colbran, Ltd.	
Bray, George, & Co., Ltd.	
Bray, W. E., & Co., Ltd.	
British Flint & Cerium Manufacturers, Ltd.	
British Gas Purifying Materials Co.	
British Oxygen Co., Ltd.	
British Rototherm Co., Ltd.	
British Thermostat Co., Ltd.	247
British Thomson Houston, Ltd.	
British Tyre and Rubber Co., Ltd.	
British Vacuum Cleaner & Engineering Co., Ltd.	
Broadbent, Thomas, & Sons, Ltd.	
Brockhouse Heater Co., Ltd.	
Broom & Wade, Ltd.	
Brown, J., & Co., Ltd.	
Bugden, Thos., & Co.	
C	
Cambridge Instrument Co., Ltd.	
Cannon (Holdings), Ltd.	
Cementation Co., Ltd.	304
Chamberlain Industries, Ltd.	
Chemical Engineering Wiltons, Ltd.	
Chemical & Insulating Co., Ltd.	
Cinema-Television, Ltd.	
Clapham Bros., Ltd.	258
Clayton, Son & Co., Ltd.	
Clifford Engineering Co., Ltd.	
Cohen, George, Sons & Co., Ltd.	
Concentric Manufacturing Co., Ltd.,	
Concrete Proofing Co., Ltd.	260
Cort, Robert, & Son, Ltd.	
Cox & Danks Ltd.	
Crane, Ltd.	257
Crone & Taylor, Ltd.	
Crosby & Co., Ltd.	
Crossley Bros.	
Curtis, A. L., & Co.	
Cutler, Samuel, & Sons, Ltd.	
D	
Davenport Engineering Co., Ltd.	
Davey, Paxman & Co., Ltd.	
Dawe Instruments, Ltd.	
De la Rue, Thomas, & Co., Ltd. (Gas Group)	Cover I
Dempster, R. & J., Ltd.	
Dempster, Robert, & Sons, Ltd.	
Derbyshire Silica Firebrick Co., Ltd.	
Diaphragm & General Leather Co., Ltd.	
Dick, R. & J., Ltd.	
Donkin (The Bryan) Co., Ltd.	Cover II
Douglas, Robert M., (Contractors), Ltd.	
Douglas, William, & Sons, Ltd.	
Drakes, Ltd.	266
Drew, H. B., Ltd.	
Dunlop & Ranken, Ltd.	
Dunlop Rubber Co., Ltd., (Gen. Rubber Goods Div.)	
E	
E.B. Refractory Cement Co., Ltd.	
Easiclene Porcelain Enamel Ltd.	
Edgar, William, & Son, Ltd.	
Elcontrol, Ltd.	
Electrofio Meters Co., Ltd.	
Electrolux Ltd.,	
Elliott Bros. (London), Ltd.	
English Electric Co., Ltd.	259
Ether, Ltd.	
Evershed & Vignoles, Ltd.	
Evode, Ltd.	
Ewart Chainbelt Co., Ltd.	
Expanded Metal Co. Ltd.	
F	
F. C. Construction Ltd.,	
Fibreglass, Ltd.	
Flavel, S., & Co., Ltd.	293
Fluxite, Ltd.	
Fowler, John, & Co. (Leeds), Ltd.	
Franki Compressed Pile Co., Ltd.	
Fraser & Chalmers, Engineering Works	
Fry's Metal Foundries, Ltd.	
Fyffe & Co., Ltd.	
G	
Gas Chambers & Coke Ovens, Ltd.	251
Gas Purification & Chemical, Ltd.	301
General Descaling Co., Ltd.	
General Electric Co., Ltd.	
General Gas Appliances, Ltd.	
Gibbons Bros., Ltd.	
Gibbons (Dudley), Ltd.	
Gibson, John, & Son, Ltd.	
Glover, George, & Co., Ltd.	
Glover, Thomas, & Co., Ltd.	270
Godfrey, Sir George, & Partners (Industrial), Ltd.	
Goodall Clayton & Co., Ltd.	
Goodyear Mechanical Goods	
Grant & West, Ltd.	
Graphite Products, Ltd.	
Green & Boulding, Ltd.	
Gunite Construction Co., Ltd.	
H	
Hamilton, A. H., & Co., Ltd.	300
Hardman & Holden, Ltd.	254
Harris & Pearson, Ltd.	
Harrisons (London) Ltd.,	
Harvey, G. A., & Co. (London) Ltd.	
Hick Hargreaves & Co., Ltd.	
Hilmor, Ltd.	
Hills (West Bromwich) Ltd.	265
Holmes, W. C., & Co., Ltd.	303
Honeywell-Brown, Ltd.	
Horseley Bridge & Thomas Piggott, Ltd.	263
Horstmann Gear Co., Ltd.	
Howden, James, & Co., Ltd.	
Humphreys & Glasgow, Ltd.	268
I	
Ideal Boilers & Radiators, Ltd.	Cover IV
I.C.I., Ltd. (Metals Division)	
Inertol Co., Ltd.	Cover II
Ingham, John, & Sons, Ltd.	269
International Combustion, Ltd.	253
J	
Jeavons, E. E., & Co., Ltd.	
Jeavons Engineering Co.	248
Jenkins, W. J., & Co., Ltd.	
Jobling, James A., & Co., Ltd,	
K	
Keay, E. C. & J., Ltd.	
Keith Blackman, Ltd.	304
King, Geo. W., Ltd.	246
King, Walter, Ltd.	296, 301
Kings Patent Agency, Ltd.	302
Kirk & Co. (Tubes), Ltd.	
Kirkham Hulett & Chandler, Ltd.	
L	
LaFarge Aluminous Cement Co., Ltd.	
Laidlaw, R., & Son (Edin.), Ltd.	258
Lamont, James H., & Co., Ltd.	
Lanarkshire Bolt & Rivet Co., Ltd.	
Lancashire Dynamo & Crypto, Ltd.	
Le Bas Tube Co., Ltd.	
Lionweld, Ltd.	
Lind, Peter, Ltd.	
M	
Macpherson, Donald, & Co., Ltd.	
Magnetic Valve Co., Ltd.	
Main, R. & A., Ltd	294, 295
Marco Conveyor & Engineering Co., Ltd.	
Meltham Silica Fire Brick Co., Ltd.	
Mercol Products, Ltd.	
Messenger & Sons, Ltd.	
Metropolitan Leather Co., Ltd.	
Milnes Meters, Ltd.	252
Mitcham Smelters, Ltd.	
Mitchell, H., & Co.	300
Moler Products, Ltd.	
Monk, A., & Co., Ltd.	
Morgan Crucible Co. Ltd.	
Morris Commercial Cars, Ltd.	
N	
National Benzole Co., Ltd.	
National Enamels, Ltd.	
New Conveyor Co., Ltd.,	
Newton Chambers & Co., Ltd.	
Norwest Construction & Co., Ltd.	245
Nu-Swift, Ltd.	302
O	
Oakland Metal Co., Ltd.,	302
Olding, Jack, & Co., Ltd.	
Oxley Engineering Co., Ltd.	
P	
Parkinson & Cowan (Gas Meters), Ltd.	270
Parkinson Stove Co., Ltd.	
Pass, E., & Co., Ltd.	
Peckett & Sons, Ltd.	
Peebles & Co., Ltd.	250
Pegson, Ltd.	
Perl Controls. Ltd.	
Plus Gas Co., Ltd.	
Pollock & Peel, Ltd.	248
Power Gas Corporation, Ltd	
Pratt Engineering Co.	
Press, William, & Son, Ltd.	
Pulsometer Engineering Co., Ltd.	
R	
R.T.S.C. Home Sales Ltd.	
Radiant Heating, Ltd.	
Radiation, Ltd.	286, 287
Rawlplug Co., Ltd.	
Reavell & Co., Ltd.	260
Richmond Welding Co.	301
Riley, A. J., & Son, Ltd.	
Roberts, R. E., & Sons, Ltd.	
Robinson, J. H., & Co. (Liverpool), Ltd.	
Rovles, Ltd.	
Royston, Geo., & Son, Ltd.,	288
Russell Bros., (Walsall), Ltd.	300
Russell, R., & Sons, Ltd.	260
S	
Salter, T. E., Ltd.	
Saunders Valve Co., Ltd.	
Scottish Non-Ferrous Tube Industries, Ltd.	
Senior Economisers Ltd.	
Service Electric Co., Ltd.	
Siebe Gorman & Co., Ltd.	
Sigma Instrument Co., Ltd.	
Simon-Carves, Ltd.	255
Simon, Richard, & Sons, Ltd.	
Sisson, W., & Co., Ltd.	256
Smith Meters, Ltd.	
Smith, Thos. & Sons (Rodley), Ltd.	256
Southalls (Birmingham) Ltd.	
Spence, Peter, & Sons, Ltd.	
Spencer Bonecourt, Ltd.	
Sperryn & Co., Ltd.	
Stanton Ironwork Co., Ltd.	
Staveley Iron & Chemical Co., Ltd.	
Stein, John G., & Co., Ltd.	
Stelcon (Industrial Floors), Ltd.	
Stewart & Gray, Ltd.	
Stewarts & Lloyds, Ltd.	
Stoves, Ltd.	
Strachan & Henshaw, Ltd.	246
Stringer Bros.	302
Sutcliffe Speakman & Co., Ltd.	
Sutherland, A. G., Ltd.	
T	
Thomas & Bishop, Ltd.	
Thomas (Richard) & Baldwins, Ltd.	
Thompson, John, Conveyor Co.	
Thorp, Thomas, & Co., Ltd.	
Tubela Engineering Co., Ltd.	
Tucker Eyelet, Geo., Co. Ltd.,	
Tully, Sons & Co., Ltd.	
Turners Asbestos Cement Co., Ltd.	
U	
Underpressure Engineering Co., Ltd.	
United Kingdom Construction & Engineering Co., Ltd.	
V	
Vale, Thomas, & Sons, Ltd.	
Visco Engineering Co., Ltd.	
Vulcan Stove Co., Ltd.	
W	
Wakefield, C. C., & Co., Ltd.	
Wakelin, F. H., Ltd.	
Walker, C. & W., Ltd.	
Walker, Crosweller & Co., Ltd	249
Waller, George, & Son, Ltd.	
Ward, Thos. W., Ltd.	264
Warsop Power Tools Ltd.	
Weatherill, F. E. Ltd.,	
Wellington Tube Works, Ltd	
Wellman Smith Owen Engineering Corpn., Ltd.	262
West's Gas Improvement Co., Ltd.	Cover III
West Hunwick Silica & Firebrick Co., Ltd.	
West's Piling & Construction Co.	
Westwood & Wrights, Ltd.	300
Whessoe, Ltd.	261
Wilkes, A. H., & Co., Ltd.	
Willey & Co., Ltd.	
Williams, John E., Ltd.	
Williamson Cliff, Ltd.	
Wilson, George, Gas Meters, Ltd.	
Winn & Coales, Ltd.	
Woodall-Duckham Vertical Retort & Oven Construction Co. (1920), Ltd.	285
Wood, Hugh, & Co., Ltd.	299
Wright, Alexander, & Co., Ltd.	
Y	
Yorkshire Copper Works, Ltd.	

Agencies	
Appointments Vacant	301, 302
Appointment Wanted	302
Contracts Open	
Educational	
Fellowship	
Miscellaneous	302
Notice	
Patents	302
Plant For Sale	
Publications	
Repairs	



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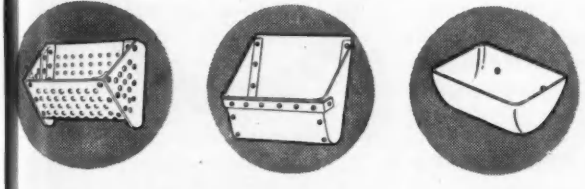

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VOL. 275 NO. 4704 July 29, 1953

CONTENTS

EDITORIAL COMMENT Page

Functional Design ... 271
Wales Experiment ... 272
Application of Scientific Research ... 272
Attitude and Trend ... 273
Gas Council Photographs ... 273
Domestic Utilisation of Gas ... 273

PERSONAL ... 274

OBITUARY ... 274

FEATURE ARTICLES

Meet the 'Mastertherm' ... 275
The Danish Gas Company's Centenary: A Fine Book to Mark the Occasion ... 276

NEWS OF CURRENT EVENTS

Diary ... 274
Plea for Meter Tokens ... 275
Transport of Liquid Petroleum Gas ... 283
Scientific Research in the United States ... 283
Dresser Adjustable Leak Clamps ... 283
News in Brief ... 291
Scottish Juniors Visit Dumbarton ... 291
Organisation and Development in East Midlands: Mr. Sydney Smith Outlines Work in Progress and Future Plans ... 292
Eastern Gas Consultative Council: Friendly Relations with Electricity ... 297
Scottish Gas Consultative Council: Board's New Projects ... 297
Mr. Nabarro on Fuel Needs ... 298
Royal Visit to Wales ... 298
Northern Sports Meeting ... 298
Sunderland Extensions ... 298
Industrial Relations Officer Visits B.G.S.A. Branch ... 298
Company News ... 298

IN PARLIAMENT

Domestic Coppers: Insulation of Buildings: Electricity Load-Spreading ... 290

TECHNICAL RECORD

Coke and Step-Grate Producers. By J. Watson, Dundee ... 277
Factors Influencing Small Works Efficiency. By E. S. Williams, Cambridge ... 278
Gasholder Foundation Design. By G. Cobb, Assistant Engineer and Manager, Buckhaven and Leven ... 281
Works Re-Organisation. By C. H. Rickard ... 282
Developments in the Wales Area. By E. M. Edwards, Member, Wales Gas Board ... 284

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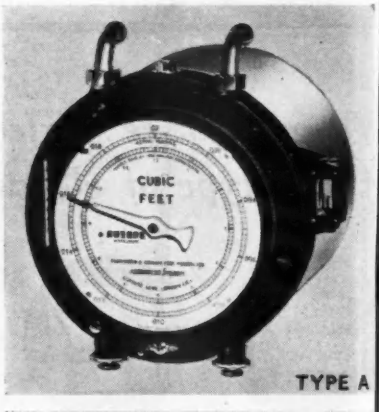

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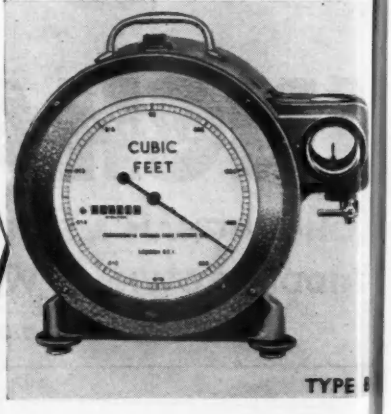

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GAS JOURNAL

VOL. 275. No. 4704 105TH YEAR July 29, 1953

FUNCTIONAL DESIGN

NEW words, or meanings of old words, come into use in the endeavour to express new ideas. Too often the new word is adopted simply because it is new and not because it is better adapted than the old to express a particular idea. A case in point is the word 'functional,' which is in danger of going the same way. The root word 'function' has, roughly, two meanings, the specialised mathematical one, as set out by Mr. Norman Hudson in his paper to the Institution of Gas Engineers, and that of everyday life in which a function is a mode of action by which a thing fulfils its purpose. The two meanings have little in common. We question whether Mr. Hudson adhered throughout his paper to either of them and whether the word always adds anything to the meaning.

For instance, the author remarks that nearly every piece of industrial equipment is specially designed for a particular process and, in consequence, its functional design is usually sound. Obviously its design is sound because it is adapted to the function it has to fulfil. The equipment contains no unnecessary complication, refinement or ornament. One sympathises with the difficulties confronting the designer of many domestic appliances. Mr. W. D. King set these out at considerable length. And one sympathises too with Mr. Hudson's attempt to generalise upon them with the help of this 'new' word. But does he do better than Mr. King's simple statement that successful design must be a compromise between technical, æsthetic, constructional, and cost factors (we omit 'functional'), the correct balance between these calling for delicate judgment?

Mr. Hudson begins with fuel. Keeping strictly to the mathematical analogy, appliance design would be a function of the fuel supply, but more simply, and not inadequately, the appliance must be designed to suit the fuel to be used in it. The difficulties in the mass production, necessary to secure cheapness, of gas appliances to meet all conditions have been sufficiently ventilated. Mr. King's contribution to the discussion on this point is authoritative. The shortened version of the already brief passage on the paper on the disadvantages of sulphur in town gas is just the old slogan 'sulphur must go.' Mr. W. G. Phillips pointed to its adverse influence on the prestige of gas supply.

The discussion of the question of free shale in coke is new, at least in presentation. Mr. Hudson has three suggestions, to clean the coal before carbonisation, to clean the particular grade of coke (we presume it would be the Institution's No. 2) sold for open fires, to break the coal down to about $\frac{5}{8}$ in. before carbonisation. The Deputy Chairman of the Gas Council, Mr. H. F. H. Jones, suggests that the first two may be too costly and that the third might cause difficulty in the throughput of carbonising plant. We suggest that the last difficulty would be slight. The two main types of plant to be considered are the two types of vertical retort. There should be no difficulty with the intermittent, and if the proportion of fines made in the breaking could be kept down, very little with the continuous. The advantages on the other hand are interesting: 'Free shale no larger than $\frac{3}{8}$ in. would not be a handicap to the appliance designer.' It would pass through the grate bars without obstructing the spaces.

Mr. Jones put his finger on several of the factors which militate against the popularity of coke with the domestic consumer. They are formidable. There is the difficuly of storage. The householder is not generally prepared to abandon coal altogether and he just has no room for a separate coke store. But perhaps the greatest difficulty is that he has no confidence yet in the regular supply of coke of the size required. Mr. A. Higgs developed this point at by no means undue length. Size seems to the consumer more important than any other property. When he is assured of this he will begin to notice such points as free shale, dust, moisture.

The author's suggested addition of a hot closet to the domestic cooker met with a cold response. It would be a great improvement, but it has not yet been 'sold' to the public—the public demand for them has not apparently warranted their extensive production. The difficulty with the enamel should be capable of resolution. Burner ignition is a little point which looms large in the user's eye. Mr. Jones put it mildly: 'Automatic ignition not only of cookers but of gas fires falls far short . . . This equipment should work for a much longer time without maintenance, should be much simpler to maintain and in the case of some gas fires much more accessible.' Frankly, after a year or two too many consumers give it up and use a box of matches.

Mr. Hudson's remarks on domestic space heating with the gas fire should be very carefully considered by manufacturers and salesmen alike. The gas fire is too expensive for all-day heating, but it has a tremendous field yet in occasional heating. The three-rate gas-control cock is an interesting suggestion. But perhaps more important are some of the observations recently

made by Dr. Harold Hartley relating to the installation of the gas fire. A particularly important point is the air extraction rate of the fire. The proposed combined coke and gas space heater, the dual-fuel boiler, will be carefully studied.

Mr. Hudson apologised for the commercial nature of some of the points made in his paper. His apology will be accepted, for there is no more urgent problem before the industry today than that of arresting the decline in consumption per domestic consumer.

WALES EXPERIMENT

WHEN the Acton Society Trust earlier this year published the last of its 12 research papers on aspects of the nationalised industries it promised a further publication dealing with the impact of nationalisation on the operational manager. The report (published at 7s. 6d.) has now appeared under the title of *Management Under Nationalisation*. Some time ago the Trust, at its own request, carried out a detailed investigation into the system of administration adopted by the Wales Gas Board, and the results of that investigation—to us the most interesting part of the book—are given in the fourth chapter of a section on studies in decentralisation. There is, we are reminded, no national managerial board for the gas industry such as there is for coal and transport. To all intents and purposes each of the 12 area gas boards is a fully independent body. It could be argued that the Wales Gas Board, with its 4,000 employees, had a simple task compared with that of the National Coal Board, with its labour force of 700,000, but the Board had to effect changes in traditional behaviour which, to the managers concerned, were just as great as those introduced at the operational levels of the coal industry. What is interesting is the different approach adopted.

The broad outline of the Wales set-up, so different from that in all the other 11 areas, is by now fairly well known. The authors refer to it as a conscious effort to build the new organisation around operational management rather than impose a new and complex framework into which the operational manager must fit himself as best he can. The experience of the Board suggests that forms of public ownership and operation are possible which have a less dispiriting effect on 'the man on the spot' than those found elsewhere. Three grids will ultimately provide the greater part of the area's gas requirements, but the Board's chief function will remain the production and supply of gas for scattered small market towns and the local manager will continue to be 'Mr. Jones the Gas' to the consumer. Wales is divided into 18 homogeneous groups, each composed of about half-a-dozen undertakings. The Board claims that none of the groups is too small for economic administration nor too large to prevent regular personal contact between managers and the Board. The Board did not introduce any management level, such as a division, with the specific task of co-ordinating the work of operational units. Indeed, there is no intermediate level of management between the Board and the managers of local undertakings. Co-ordination is secured by the local managers themselves working through group committees. The structure is not one that would suit other areas, but despite some early misgivings it has proved successful in Wales.

The Board believes that the group committee maintains individual responsibility, gives local managers contact with the Board, and at the same time meets the need for co-ordination. It also provides a platform for informal discussions and exchange of ideas. Before the group committee system had stood the test of time it would not have surprised us to detect a desire for some reinforcement, in the sense that the group chairman might have been given specific oversight over the smaller works in the group in the rôle of group engineer. The group committee chairman is in most cases the engineer and manager of the largest undertaking in the group. He carries the responsibilities of his own undertaking as well as those of a sort of 'chairman of directors' of all the others. For the latter services he receives no remuneration beyond the salary appropriate to his own particular job. If there were any wavering in group loyalties he would have no executive powers over the smaller works in the group. He holds office not by edict of the Board but by the free election of his fellow members, and so far as we know the group committee could change its chairman if it so desired.

It has been our privilege to attend and participate actively in one of the periodical conferences of chairmen and conveners of group committees and Chairman and officials of the Board, and we have discovered no sign of any failure in the experiment. Group accountants—some of whom serve more than one group—have taken care of the responsibility of ensuring that the accounting systems of all constituent undertakings are properly kept, and a technical advisory service has been introduced by the group committees in conjunction with the Board's senior chemists. The Board's policy has been to disturb human relations at the various levels of its organisation as little as possible. Instead of rushing in with a host of specialists and building up a 'vertical' structure, it has been satisfied to lay solid 'horizontal' foundations. The problems uncovered by the survey, and criticism by operational managers and others, indicate that this emphasis has not been misplaced.

APPLICATION OF SCIENTIFIC RESEARCH

IN ITS REPORT FOR 1952-53 the Advisory Council on Scientific Policy analyses the reasons for the comparative failure of British industry to exploit to the full the results of scientific research. The Chairman of the Council is Professor A. R. Todd, and its membership includes Sir Harold Roxbee Cox, Chief Scientist to the Ministry of Fuel and Power, and Sir Cyril Hinshelwood, who is a member of the Gas Council Research Committee. The the report points out that industry is hampered by shortage of scientists and technologists, neither of which can properly be considered in isolation. The Council does not express surprise that most British manufacturing firms set aside for research and development only a small proportion of their resources. Only the more progressive and larger industrial undertakings can as a rule afford to take full advantage of scientific progress. Even when firms are fully aware of the technical steps they could take to improve the efficiency of their production, they often do not take them for lack of sufficient resouces. Present financial and personnel difficulties have, however, a background of industrial conservatism, for there can be no doubt that most firms were content to do very little in the inter-war years, when money was more readily available. Restrictive practices by both management and

labour, as well as complacency and reluctance to depart from things of the past, are widely recognised as major factors underlying the backwardness of British industry. These things undoubtedly contribute to industrial stagnation, comments the Council; but their persistence is almost certainly encouraged by the lack of adequate resources. It would, however, be a grave mistake to assume that the mere production of a greatly increased number of scientists and engineers would solve all our problems. Unless further financial and other resources are invested in industry, such men could be of only limited use. All possible means should be examined whereby industrial development may be encouraged, by the provision of extra resources, extra incentives, and greater productivity.

ATTITUDE AND TREND

THE SUBJECT OF SCIENCE AND INDUSTRY was debated in general fashion in the House of Commons last week, and we were interested in the comments of Mr. Palmer who put forward the suggestion that the cause of the shortage of professional engineers and technologists was to be found in the whole bias and the continued assumptions of our educational system. Its shabby-genteel outlook, which had its disciples among the intellectuals of both major political parties, was, he said, founded on the belief that industry and technology were morally and socially inferior to the acquisition and pursuit of knowledge for its own sake. Knowledge itself was divine, but the application of it just mortal. The result of that attitude was that although the pure or research scientist was now received into the charmed circle of the respectable professions, the engineering technologist was still not sure of his welcome. However, relieving the gloom, Mr. Shepherd argued with some vehemence that it was wrong to take the view that British industry was dormant or that industrial prospects were low. His contention was that if scientific achievement could be advanced as much in the next five or 10 years as it had been in the past five or six years, we should probably be in a better position than any industrial community.

GAS COUNCIL PHOTOGRAPHS

THERE IS NOTHING NEW in the Gas Council's appreciation of the publicity value of photographs. Long before nationalisation the British Commercial Gas Association and later the British Gas Council maintained a photographic library of photographs secured from outside sources as well as those taken by the Council, and its contents were kept up to date with the idea that prints should be instantly available for use by member undertakings, the Council itself, the Press, and others requiring pictures relating to the manufacture, distribution, and utilisation of gas. We recall that at the last meeting of the B.G.C. four days before vesting date the annual report recorded that during the last year of private enterprise 557 negatives were filed, 5,200 prints and 483 enlargements were made, and 1,288 photographs were loaned.

What is new about the library is that Part 4 (Industrial) of the photographic library catalogue has just been issued, and that this completes the considerable task of listing all photographs contained in the library in convenient sections—namely, Part 1, Domestic; Part 2, Gas Manufacture and Distribution; Part 3, Commercial; and Part 4, Industrial. In the past year the practical and effective use of the photographic library has been materially increased, not only through innumerable reproductions in all sections of the Press, but also as applied to the basic content of Gas Council publications, films, and exhibitions. Mr. R. J. Gregg, the Gas Council's Publicity Manager, has broadcast an appeal to the industry generally through the area boards for continued collaboration in the provision of up-to-date photographs of appliances and installations so that they may be made readily available for the national, specialist, and technical Press, Gas Council information, and area board publicity. Supplements to the library catalogue will be issued from time to time.

'DOMESTIC UTILISATION OF GAS'

THE ANNOUNCEMENT in this issue of the *Gas Journal* that a new and entirely revised edition of *Domestic Utilisation of Gas* by Smith and LeFevre will, we hope and believe, be widely welcomed. The first edition of *Domestic Utilisation of Gas* was published in 1932 and it met with an immediate and most encouraging reception. The basic idea was to present in readily assimilated form the principles of gas utilisation in the domestic sphere. A second edition appeared in 1937, while a year previously Part 2 of the work was published. After the war the two parts were published as a composite edition. Now we have the new book, which brings together the fundamental principles of Parts 1 and 2 in the light of current knowledge and experience and introduces many diagrams to which the authors attach much importance. The current edition applies particularly to students in the courses which comprise the Gas Education Scheme, which is embarking on a new phase. The subject-matter has been planned to help those who are studying for Gas Engineering (Supply), Gas Technology (Supply), Gas Salesmanship and Consumer Service, and Gas Fitting. And though it is appreciated that a knowledge of gas utilisation *per se* is not required specifically in courses of gas manufacture, students on the 'works' side should profit considerably by a study of this book, which will give them, among other things, an understanding of the needs of their product at the consumer's end.

ASLIB (formerly the Association of Special Libraries and Information Bureaux) is establishing a register of specialist indexers, comprising persons available for part-time indexing only. A staff employment register is already maintained for indexers and other library staff seeking full-time, temporary or permanent, employment. Indexers will be enrolled in two categories: those who can produce evidence of indexing ability, and those who appear to possess the necessary qualifications, but who have no published indexes to their credit. Enquiries should be addressed to the Director, Aslib, 4, Palace Gate, London, W.8. Under the terms of the register, which is licensed annually by the L.C.C., no charge will be made to employers, but a small enrolment fee and commission will be charged to indexers accepted for enrolment, unless they are personal members of Aslib.

THE INDUSTRIAL AND DOMESTIC COAL CONSUMERS' COUNCILS have issued their sixth annual reports as one document. They relate to the year ended June 30, 1953. The report notes that gas coke has been readily obtainable during the year but that there has been some difficulty in keeping pace with the growing demands from the blast furnaces for hard coke, due to the increased activity in the steel industry. The increasing requirements of the carbonisation industries and of the steel industry, the report goes on, is a serious problem; and the Councils are glad to know that it is having the close attention of the N.C.B. The introduction of an experimental bonus and penalty scheme under which the price of some of the coke bought by the steel industry varies with its moisture content has been observed with interest. This scheme is designed to keep the moisture in the coke supplied to the steel industry within narrow limits, largely to avoid the deleterious effect of excessive moisture on the life of the furnaces. The Councils recommend the early adoption of the proposals of the Eastern, North Thames, South Eastern, Southern, and South Western Gas Boards for improving the marketing of coke in their areas. They believe that eventually this will lead to better service to consumers.

Personal Notes

MR. W. J. CANNON, who recently completed 25 years' unbroken service in the retort house at March gasworks, was presented by Mr. J. Hunter Rioch, Divisional General Manager, Cambridge Division, on behalf of the Eastern Gas Board, with a long service certificate and a monetary gift.

MR. J. R. WALLACE has been appointed by J. H. Robinson & Co. (Liverpool), Ltd., as representative to look after the company's interests throughout the industry. He will assist Mr. William Foster, Director, operating from the company's Manchester office at 85, Mosley Street.

MR. WILLIAM S. CAIRNS has retired after 34 years with the gas undertaking at Carluke. Employees and former directors of the Carluke Gas Company (now nationalised) have presented him with an occasional chair. Mr. Cairns went from Edinburgh in 1919 to take over the post of secretary and treasurer of the company, of which he became a director in 1938. When the undertaking was nationalised he was retained by the Scottish Gas Board in charge of the local office and administration.

MR. MUNILAL MEHRA, Commissioner of Customs and Excise for India, is undertaking a comprehensive tour of Europe and America to study manufacturing methods and labour conditions with a view to the development of industry and trade in India. Mr. Mehra, in addition to his position in the Indian Government service, is an industrialist and youth leader. He controls a number of Indian textile mills, and is vice-president of the Indian Youth Council. Mr. Mehra spent a day at the Luton works of Radiation Ltd., and discussed the design and manufacture of gas cooking appliances with senior management executives after being shown round the works. Of special interest to Mr. Mehra were the appliances adapted for use with bottled gas, appliances which Mr. Mehra considers may find a wide market in his country.

MR. E. ALLISON, Chief Engineer of the Portsmouth, Gosport, and Bognor Regis undertaking, has retired after 50 years' service in the industry. He served his articles with the Chester United Gas Company from 1903-1908 and then moved to George Waller & Son, Ltd., Stroud, as mechanical draughtsman. From there he held successive positions with the Londonderry Gas Light Company, Airdrie Gas Department, and Redhill Gas Company. In 1916 he was appointed Engineer to the Gosport District Gas Company, becoming Engineer and General Manager in 1920. When the Gosport Company was amalgamated with the Portsmouth Gas Company in 1936 he became Engineer of the Portsmouth and Gosport Gas Company. Later he received the title of Chief Engineer, which was continued by the Southern Gas Board on the formation of the Portsmouth, Gosport, and Bognor Regis undertaking. Following Mr. Allison's retirement, MR. H. M. LAWRENCE, General Manager of the undertaking, is designated Engineer and General Manager, and MR. J. B. RICH, formerly Deputy Engineer of the Isle of Wight undertaking, becomes Assistant Engineer and General Manager.

MR. ERIC R. THOMAS, Managing Director of Elcontrol Ltd., was married on July 18 to Miss Joyce Hulatt, Secretary to Mr. Walton A. Cole, Editor of Reuters, for the past 11 years.

LORD LLOYD, Under-Secretary of State for Welsh Affairs, has agreed to open officially the new Maelor gasworks near Wrexham on October 14. This was announced by Mr. T. Mervyn Jones, Chairman of the Wales Gas Board, last week.

DR. G. A. STEELE, M.B., CH.B., M.R.C.S., L.R.C.P., D.P.H., Assistant Divisional Medical Officer, Lancashire County Council, has been appointed by the West Midlands Gas Board as junior Assistant Medical Officer at Board headquarters.

MR. J. C. COTTERILL, Engineer and District Officer to the St. Austell Group of undertakings, South Western Gas Board, has been appointed to a similar post at Stroud, Glos. Mr. Cotterill has been at St. Austell since 1935, where he was Engineer and Manager to the former St. Austell and St. Blazey Gas Companies and Engineer to Lostwithiel Gas Company. He received his early training at Redditch under Mr. C. F. W. Rendle and after three years at Worcester was appointed Engineer, Manager and Secretary to the Okehampton and Bude Gas Company. Mr. Cotterill is being succeeded at St. Austell by MR. J. A. BELL, of Brixham.

DR. G. E. FOXWELL, President of the Institute of Fuel, and DR. R. LESSING, O.B.E., have accepted membership of the committee appointed jointly by the Minister of Housing and Local Government, the Secretary of State for Scotland, and the Minister of Fuel and Power to examine the nature, causes, and effects of air pollution, and the efficacy of present preventive measures; to consider what further preventive measures are practicable, and to make recommendations. The Chairman of the Committee, which will begin work immediately, is Sir Hugh Beaver, M.I.C.E.

MR. M. MCENNERNEY, who prior to his retirement in 1946 had been employed for 45 years by the Keighley Gas Department, rising from junior clerk to manager of the department's showrooms, has been made an honorary life member of Keighley Art Club, of which he is a founder member and served as secretary for over 25 years. Mr. McEnnerney has been interested in painting all his life. During his period as secretary he organised some 40 national and local art exhibitions at Keighley, which won for him the appreciation of many notable artists. He played a prominent part in the formation of the Yorkshire Federation of Art Clubs and was its secretary until 1939 when the war ended the federation's activities.

Obituary

MR. JAMES S. BURGOYNE, who for 23 years was a representative of Parkinson and Cowan Gas Meters, died in a nursing home at St. Albans on July 19, aged 66. During his service with the company he was engaged in the main in southern England and Wales, where he had a very wide circle of friends. He was a member of the Wales and Monmouthshire and the Eastern Sections of the Institution of Gas Engineers and was regular in his attendance at their meetings until ill-health kept him away during the past 12 months.

MR. JAMES J. FRASER, Managing Director of Honeywell-Brown, Ltd., died at his home on July 17, aged 51. Born at Grantown-on-Spey, in Scotland, he graduated from Edinburgh, and spent a number of his early years in West Africa. In 1928 he joined the Minneapolis-Honeywell organisation in Canada, where he became Manager of the Montreal office. When, in 1936, a decision was taken to form the British company of Honeywell-Brown, Ltd., Mr. Fraser was chosen for this work. As Managing Director since its inception, he has been directly responsible for its growth and development over the years.

MR. HAROLD BARLOW, a Director of Meters, Ltd., died on July 15, after a short illness. Beginning his business career in 1894 with George Orme & Co., Mr. Barlow maintained an unbroken service of over 58 years with the firm. After an initial period in the office, he became a junior representative in 1903 and continued to cover the company's outside interests until 1927, when he was appointed Commercial Manager. This position he held for a year only, and in 1928 he became General Manager. He was appointed a Director of Meters, Ltd., the parent company, in 1931. He was a Director of Metropolitan Gas Meters, Ltd., Nottingham, a member of the executive committee of the Engineering Employers' Association for the Oldham district, and a member of the council of the Oldham and District Chamber of Commerce.

Diary

July 30.—NORTH THAMES G.C.C.: Westminster City Hall, Charing Cross Road, W.C.2.

August 17.—WEST MIDLANDS G.C.C., Queens Hotel, Birmingham, 2.30

Sept. 1.—EAST MIDLANDS G.C.C., Victoria Station Hotel, Nottingham, 11.30 a.m.

Sept. 3-9.—BUILDING PLANT EXHIBITION, organised by the Ministry of Works. Goose Fair Site, Nottingham.

Sept. 3-17.—ENGINEERING, MARINE, AND WELDING EXHIBITION (including Chemical Plant Exhibition). Gas Council exhibit. Olympia.

Sept. 9.—SOUTH WESTERN G.C.C.: 34, Bridge Street, Taunton, 11 a.m.

Sept. 10.—WALES AND MONMOUTHSHIRE SECTION, I.G.E.: Annual General Meeting, Carmarthen; Discussion on the Report of the visit of the Gas Industry Productivity Team to the United States to be opened by E. M. Edwards, Member, Wales Gas Board.

AN INVITATION FROM RADIANT HEATING LTD. TO

Meet the MASTERTHERM

THE virtual saving of the gas industry by the invention of the incandescent burner was the theme of Mr. Arthur Docking's brief introduction to the exhibition staged by Radiant Heating, Ltd., at the Building Centre, Store Street, W.C.1, on July 22. Looking back over his nearly 60 years in the industry to the day when the flat flame burner was

An interested visitor was Mr. Veechi, of the Hungaria Restaurant, who in this Gas Journal *picture is being shown the new salamander by (left) Mr. C. A. Lewis, Director, Radiant Heating, Ltd.*

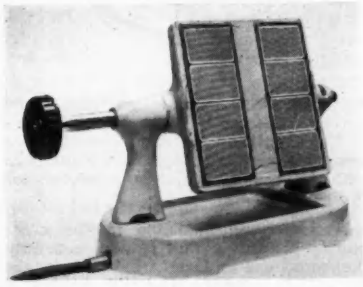
the only answer to mounting competition, Mr. Docking praised the name of Dr. Bunsen, the importance of whose work he compared with William Murdoch. It was the incandescent burner that was responsible for the industry's survival during those difficult days and for its importance to modern life. 'If in some way gas had been taken away from us,' said Mr. Docking, 'we should have lost not only the first war, but the second one too. There was not a munition factory that did not rely on gas in performing its vital function in the national effort.'

Mr. Docking explained that the purpose of the exhibition (which was attended not only by the Press but by many well-known people in the industry) was to introduce the latest additions to the firm's range of surface combustion appliances which are designed to operate at 16/10ths W.G. pressure—or as Mr. Docking remarked, even at 10/10ths in certain cases. These were the result of 18 months' work and produced results far superior to those of burners manufactured in Germany which required high pressure gas.

The exhibition effectively demonstrated the possibilities of these surface combustion burners—named 'Mastertherm' burners—in appliances of various types.

For space heating the Mastertherm overhead radiant heater, fitted with these ceramic plaque burners, and operating on town gas at 16/10ths W.G., is neat in appearance, having a modest vitreous enamelled surround, and is supplied in three sizes—12,500 B.Th.U., 25,000 B.Th.U., and 37,500 B.Th.U. per hour.

The new combined café grill and salamander is suitable for cooking steaks and chops, or by turning the handles the burners are rotated through 90° and the appliance is then ready for toast, etc. Gas input is 22,500 B.Th.U. per hour.



Of particularly neat design, this new domestic combined grill and toaster is shown in a tilted position, thus revealing the surface combustion burner.

The Mastertherm salamander and the café grill—two new appliances introduced at the exhibition.

Other applications include a very neat domestic grill and toaster, a salamander suitable for large scale kitchens and, in the industrial field, an industrial drying tunnel.

Our Staff Photographer was responsible for this photograph of, left to right: Mr. Frank Yerbury, Director of the Building Centre, Sir John W. Stephenson, Chairman of the Eastern Gas Board, and Mr. Arthur Docking, Chairman of Radiant Heating, Ltd.

Plea for Meter Tokens

THE WEST DISTRICT COMMITTEE of the North Western Gas Consultative Council is to ask the Board to consider the question of introducing tokens in place of shillings for insertion in gas meters. The Committee was told that at times large sums of money in shillings were locked in gas meters in Liverpool where meter robberies had been much on the increase recently.

Councillor Arthur Lowe, the Chairman, said some hard cases had come to light as a result of the robberies, and these were being brought to the notice of the Board.

It was suggested that if tokens were used the incentive for robberies would be removed.

The Committee is also to press the Board for more information regarding installation charges, particularly in the Liverpool area where, it was stated, there was a fixed charge of 30s. for moving a cooker irrespective of the time or labour required.

Councillor Lowe instanced one case where the time occupied was only half an hour and practically no material was used, but the charge was still 30s. In fairness to the consumer the Board should stop this sort of thing, he said.

The Danish Gas Company's Centenary

A Fine Book Marks the Occasion

THE Danish Gas Company, a business which has completely English roots, is celebrating this month the centenary of its incorporation. The company started in Odense, the birthplace of Hans Christian Andersen, but, as the Chairman points out in a foreword to a beautfully produced book giving the history of the company, the record is no fairy story but a review of a century of enterprise and fortitude.

The event has just been celebrated at Odense itself. The King of Denmark distinguished the occasion by conferring upon the Vice-Chairman of the company, E. A. L. Petersen, the Order of the Dannebrog, which corresponds to a Knighthood in this country.

The function was presided over by the Chairman, Lieut.-Col. E. C. Woodall, O.B.E. Gas runs in families, a tendency which nationalisation in this country does not seem to have changed, and Colonel Woodall's family can run back in direct succession, son to father, over the past 57 years. At the same board on this occasion, sat Lieut.-Col. Harold F. Bidder, D.S.O., whose forebear, George Parker Bidder, was a founder of the company a hundred years ago.

Although nothing to do with the gas undertaking itself, another 'centurian' sat at the table; he was the British Consul, Hans Muus, for there has been a Muus as British Consul at Odense for more than a hundred years.

Others present included the British Ambassador to Denmark, two members of the Cabinet (the Ministers of Trade and Transport), the Mayor of Odense, who has held the post for 18 years and is credited with being the most popular Mayor in the country, the Deputy Mayor, and Colonel Sir Harold Smith, the Chairman of the Gas Council.

The pioneers of the company built their first works at Odense and, over the years, carried the vital flame throughout the whole country, perhaps one of the most notable stages being to Copenhagen, the capital, where the streets were lighted four years after the initial 'invasion.' The various undertakings in the provincial towns soon became prosperous and were gradually absorbed by the municipalities, in a progress which the commemorative book tells. Odense, however, reputedly the best-kept gasworks in Europe, remains the company's stronghold and will so remain for another 10 years at least, under a recent agreement.

There were big brains behind the pioneer days of the Danish Gas Company. Already, two of the adventurers were building a railway system for the Danish Government. One of them, Samuel Morton Peto, had been associated with the erection of Nelson's Column and the Houses of Parliament, in which he later sat as a member. The other, George Parker Bidder, who had a phenomenal brain for mental calculations (as a youth he was known as 'the calculating boy'), left as his great memorial the Victoria Docks, built on a swamp in defiance of expert opinion.

The actual construction of the first gasworks at Odense owes its origin to one Regnar Westenholz, a Mark Lane coal merchant, who established another of the long dynasty of family associations with the company.

When it was introduced to Denmark, gas was known as a vehicle for lighting and the company's first triumph was the lighting of the streets of the town where

Andersen's fair mental light had shone before. But the business quickly passed to the supply of gas for its many other purposes and has since kept close pace with all the scientific developments of the gas industry.

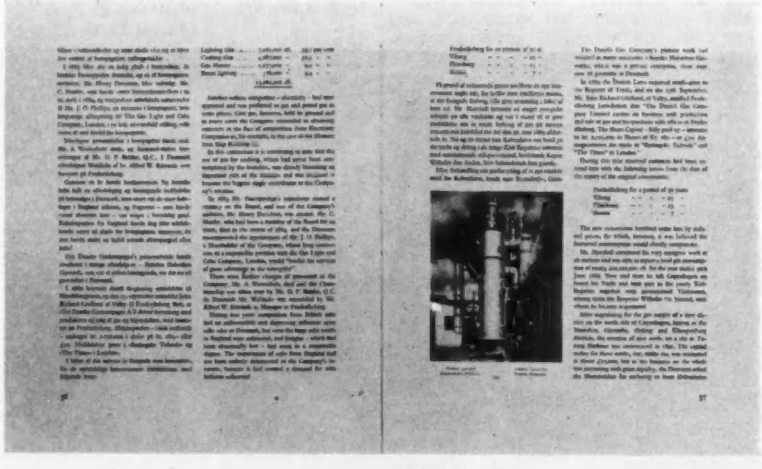
An interesting sideline in the company's history is that it had not only pioneered gas in Denmark but it taught the natives cricket. The first display at the Odense gasworks was a matter of astonishment rather than admiration, but the seed steadily grew to such an extent that in this, the company's centenary year, a Danish national cricket team visited England for the first time. Ten years after the cricket year, 1868, the staff also introduced football, but that 'caught on' immediately and they had many imitators.

Despite the soundness of the company's present position, the conduct of the business has not, as the commemorative book shows, been without its trials and tribulations. Its life has embraced two major wars. Although Denmark was not directly involved in the first of these two encounters, the difficulties of owning property in foreign territory and of dealing in foreign currency and of maintaining supplies which came across waters jealously watched by a belligerent were far from small.

The second conflict saw Denmark not only involved, but occupied by a foreign power. The conduct of the staff and management under those conditions makes an absorbing chapter of bravery and astute business acumen.

However, in the end, a telegram was despatched from London and a reply came back which re-established a link which war had suspended, but not broken. Historically, this link might have ended in 1954; but two years ago, the association which had begun on a rainy afternoon in London in the City of Westminster with a cab ride to the sumptuous offices of the bankers, Glyn Mills, in Lombard Street, was renewed.

A century of hard work which forms a happy business association between England and Denmark, will continue.



a/s Det Danske Gaskompagni *is a fine book, a quality which befits the centenary it records. Danish and English texts appear side-by-side on each page. The design of the book combines the golden rules of traditional typography with the mechanical precision of modern printing. This reproduction of a pair of pages gives an idea of the handsome margins and nice spacing of the text. Above is shown the Company's seal which has been used as the dominant feature of the distinguished title page.*

COKE AND STEP-GRATE PRODUCERS

PAPER TO THE SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT) BY

J. WATSON,

Dundee Undertaking, Scottish Gas Board.

DURING the last few years there has been evident a gradual but serious deterioration in the size of coke produced by gasworks which have become increasingly dependent on the supply of coal from the Fife and Clackmannan coalfields. With the planned extension of these areas and the reduction in tonnage of the more highly swelling coals from the Central area it would appear that this deterioration in size is likely to continue. Suitable gas-making coals from the Fife and Clackmannan coalfields are generally of low rank and produce in the continuous vertical retort an extremely reactive but very friable coke of small size.

An examination of the following table gives an indication of the swelling properties of the coals carbonised by the Dundee undertaking during the year ended March 31, 1952.

B.S. Swelling No.	1	1½–2	2½–3	3½–4	4½–5	5½–6	6½–7	Over 7
%	77.63	9.34	0.24	3.66	8.07	0.44	0.62	*Nil*

Of the total coal carbonised 86.65% came from the Fife and Clackmannan area, 12.79% from the Central area and the remaining 0.56% from the Lothian area.

The above selection of coals produced an average run-of-retort coke with the following analyses.

Proximate Analysis	%	Grading Analysis	%
H_2O	10.2	Under ¼ in. ..	19.3
V.M.	1.8	¼ in.-½ in.	9.4
F.C.	75.5	½ in.- 2 in. ..	57.6
Ash	12.5	Over 2 in.	13.7
	100.0		100.0

Bulk Density 24.0 lb. per cu. ft.

The variation of the size of this run-of-retort coke must, however, be taken into consideration. During the above period the percentage under ¼ in. varied between a minimum of 10% and a maximum of 35%, the higher figures normally occurring during mid-winter when coal was being taken from store. During the current winter figures as high as 43% under ¼ in. have been recorded when the coal *ex* store has approached 100% of the coal carbonised. The friability of the coke results in even these high percentages of breeze being considerably increased before the coke reaches the coke consuming plant.

The result of the deterioration in size and increase in friability has shown itself in the quantities of breeze available for sale. In 1949 the breeze under ¼ in. available for sale accounted for 20.16% of the total coke production, while in 1952 this figure had increased to 30.16% and it may even be exceeded during the current period.

A Source of Difficulty

Besides the obvious loss in revenue, greater difficulty has been experienced in the coke-consuming plant in the works, particularly the step-grate producers. A coke of small but consistent size can normally be compensated for by normal alterations in produce operation—*e.g.*, slower rates of gasification by increasing the grate area, etc. It is, however, the violent fluctuations in size which start many of the troubles found in step-grate producer practice. The more uniform in size the fuel the more readily can the producer be operated in a satisfactory manner since any condition which interferes with the passage of air and steam through the fuel bed is likely to reduce the quality of the producer gas and place a limit on the producer capacity.

As the size of fuel is reduced the reaction zone becomes smaller, and the increase of surface area of the smaller coke results in a rise of temperature which, if it exceeds the fusion point of the ash, leads to clinker.

The smaller coke tends to run through the fuel bed and quantities of it are inevitably pulled out with the ashes. Good coke is thereby lost and we find that the fuel consumption figures for the producers rise. The reduction in output of producer gas may require an additional producer, or even producers, with the attendant heat losses due to radiation ash losses, etc., not forgetting any additional labour that may be required.

Moisture tends to increase with the smaller sizes of coke and may, when the coke is freshly quenched, amount to as much as 20%. Additional heat is necessary to vaporise this water and it may even reduce the producer gas temperature sufficiently to affect the combustion chamber temperatures.

Segregation may also take place in the fuel bed, the extent of the segregation depending on the divergence between the maximum and minimum sizes. Any variance in the density of the fuel bed promotes channelling with the production of a producer gas of low calorific value and high sensible heat again adding to the danger of clinker formation. In Dundee segregation in one battery of producers resulted in fines building up at the rear of the producers and partially blocking the gas offtakes between the rear wall and the curtain arches, causing an excessive pressure under the charging lids.

Producer gas from small-sized coke carries with it increased quantities of ferruginous dust which entails extra labour in the cleaning of the retort flues besides causing erosion of retort brickwork and fluxing of nostrils, dampers, etc.

Costs of Screening

As far as the producers are concerned part of the answer lies in the use of riddled coke during selected periods of the year. In this way many of the difficulties mentioned above may be overcome. However, in balancing the benefits gained sight must not be lost of the cost of riddling this coke. Tests over an extended period in Dundee showed that 85% of the coke over 2 in. leaving the retort houses was broken to below this size in its passage from the benches via a rotary screen to the outlet of the storage hoppers. At the other end of the scale there was an increase of 66% of the breeze under ¼ in. These figures enmhasise not only the inefficiency of the rotary type of riddle but the extreme friability of the coke produced from Fife and Clackmannan coals. The screening plant in Dundee is old and inefficient, but steps are being taken to have this rectified in the near future. At the existing price differential between coke and breeze of over 50s. per ton it can be seen that the use of riddled coke to producers in the above circumstances can be a very expensive matter. There is also the difficulty of the disposal of the extra breeze produced and an increased load of anything up to 20% on a probably already overloaded screening plant.

It is, of course, possible to select coals and carbonise these in a selected retort bench in order to produce a satisfactory coke. This is also an expensive method of acquiring good producer fuel, as these coals may be from 4s to 11s. per ton dearer than the average price of coal bought solely for gas-making purposes. As these coals are also in limited supply it means a deterioration in the coke produced from the rest of the gas-making plant.

To preserve the size of coke as far as possible during the winter months it has been a practice in Dundee to store during the summer period, separately from the bulk of the coal laid down, a certain quantity of coal with a higher swelling index. Coals which have a good initial swelling number appear to be capable of retaining this power for two or three years to an extent sufficient to produce a satisfactory screen analysis on coke produced from

them although their value definitely and progressively decreases. Size too plays a part in deciding the coals to store. During storage of most coals there is a decline in size, particularly with coals of low caking power. The changes that a definite period of storage will produce are more marked with the smaller sizes of coal. The reason for this is that the more finely a coal is divided the more liable it is to oxidation and weathering. It has been said that in the case of 2 in. by 1 in. coal the rate of decrease of caking power is about a quarter of that in a slack coal. When carbonising coals of low swelling power in continuous vertical retorts we have found that the coke size definitely improves as trebles are substituted for doubles.

By a combination of the above methods it has been possible to maintain a reasonable fuel for the step-grate producers and to keep the quality of the producer gas at an optimum level. The average producer gas at the Dundee undertaking for the six-month period, July, 1952, to January, 1953, was:—

	%		%
CO_2	5.9	H_2	10.0
CO	28.0	N_2	55.7
CH_4	0.4	C.V. (gross) 128 B.Th.U. per cu. ft.	

Excluding recent years, there has always been such a wide gulf between the value of coke and gas that too little scientific approach has been made to step-grate producer design and operation. Much has been done to remedy this with the advent of the mechanical producer, but what is to happen to the many medium and small works and not a few large ones which will be dependent on step-grate producers for many years to come? The old-fashioned approach to producer fuel of 'anything will do' should no longer be considered.

It is obvious too that steps must be taken to improve the general quality of coke not only because of its effect on producers, but because its sales value constitutes a major item in the economics of the gas industry. If only a part of the time and energy given to control of the calorific value of gas was given to quality control of coke many happier coke consumers would be seen and perhaps the problem of breeze disposal would not be as acute as it has been during recent years.

Factors Influencing SMALL WORKS EFFICIENCY

PAPER TO THE EASTERN JUNIOR GAS ASSOCIATION BY

E. S. WILLIAMS,

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MUCH of the plant in use on small works is bordering on obsolescence and may have been in operation for 40 years or more, having been kept going only with some degree of improvisation. Though still giving service in this state, often under conditions of overload, the attainment of standards of efficiency taken for granted in larger works presents a problem which is not easily solved without extensive renewal of plant. These conditions are accentuated by the fact that the employment of shift foremen and day-to-day technical supervision is not an economical possibility where smaller works are concerned. Where, however, certain undertakings have progressed in adopting modern developments in plant and operational policy under capable management, it is noticeable that efficiencies obtained are equal to those of larger works with comparative plant.

Carbonising Plant

In striving for increased efficiency and therefore economy in operation, the carbonising unit offers the most scope for improvement in the majority of small works. It has been amply demonstrated by cost analysis that it is the gaseous thermal yield and the coke produced for sale values which are the dominant factors in deciding profit or loss. Yet all too often on small works the amount of attention and supervision allocated to ensure efficient carbonisation is trifling in proportion to the importance of maintaining maximum efficiency.

Mainly for this reason it has been suggested that the most suitable plant for works of 100 mill. cu.ft. or less per year is the horizontal retort setting, since vertical plant requires more technical supervision. Small vertical settings have, however, proved to be well worth the extra attention required, and the trend has been to replace horizontal by vertical benches in many cases where the old hand-charged stop-ended horizontal settings have become played out. The high thermal gas and coke for sale yield, coupled with waste heat recovery and flexibility of calorific value and output, makes the continuous vertical bench an attractive proposition. Then, provided the operating personnel are trained in vertical retort practice, this type of plant is superior in most ways to horizontals for small works.

Common to both types of setting is the fact that generally the plant is required to provide for both base and peak loads. Primarily this adversely affects fuel consumption efficiency by reason of the seasonal necessity of maintaining retorts under fire to cope with sudden demands for gas. Further undesirable effects follow, however, in endeavouring to increase or decrease output with the plant in use. With horizontals, to obtain an increase in output, carbonising periods are reduced often to a stage where the coal is by no means fully carbonised when discharged; and for a reduction in output the charges are lightened beyond economic levels. With verticals, increasing output by stepping-up coal throughput gives rise to difficulties in lowering the calorific value to the desired level by steaming; in reducing output the thermal yield decreases due to the lower percentage steaming possible with low throughputs.

Avoidable Inefficiencies

With both horizontal and vertical installations, however, avoidable inefficiencies are found, and where poor results were being obtained the main contributory factors could be summed up as follows:—

(i) Difficulty in obtaining adherence to good practice at all times.
(ii) Incorrect pressure conditions at retort offtakes.
(iii) Low retort temperatures.
(iv) Poor condition of retort brickwork and ironwork.
(v) Light charges or low throughputs.
(vi) Excessive fluctuation of exhauster vacuum.

There is little doubt that the efficiency of the retort house operators has a large influence on small works results, this being especially so in horizontal retort practice. Instructions given to stokers are not always precisely observed or consistently carried out as long as the flow of gas to the holder is maintained. This may be due to some extent to insufficient supervision, and under present-day conditions it is not always possible to obtain men for the arduous work entailed in stoking. More can be done, however, by improving the lot of the stoker and the results obtained from him. He is frequently required to work with inefficient retort house equipment—coke barrows and producer charging skips in the first stages

of collapse, worn charging shovels, blunt and insufficient length clinkering bars, distorted augers, and the like. Coupled with this, uneven floorings in and around the retort house present a hazard which makes a heavy job more arduous and therefore less efficiently carried out.

Pressure Conditions at Offtakes

Considerable difficulty is often experienced with both horizontal and vertical settings in maintaining correct pressure conditions at the retort offtakes, this being especially so on small horizontal retort settings where large variations in gas volume occur. In some cases no retort house governor is provided, stable conditions depending entirely on constant control of exhauster vacuum. In other cases, the old direct-operating bell type governor is in use, and though not completely satisfactory these are reasonably efficient provided the exhauster pull is kept constant. Where the more modern types of governor such as the Reavell Askania or Parkinson B.K. are installed, the superior sensitivity of these is reflected in the increased thermal yield, as variations in volume and outlet pull are more readily dealt with. Severe fluctuations in pull, sometimes encountered on small works through poor exhauster governing, are, however, not completely smoothed out by the best of retort house governors, and in consequence the loss of at least one therm per ton may result from the slightly unstable conditions so produced at the offtakes of either vertical or horizontal retorts. Despite adequate governing, incorrect offtake pressures are usually found where the stoker is relied upon to adjust the governor or, more often, carries out unauthorised adjustments. Excess pull is invariably the tendency in an effort to show the maximum gaseous volume made per shift, and the resultant entrainment of inerts on the one hand and the loss of gas through blocked offtakes on the other can only result in a reduced thermal yield.

Retort temperatures often leave much to be desired, especially where adequate supervision is lacking. Low and unevenly distributed heat can usually be attributed to maladjustment of dampers and open joints in the setting brickwork, resulting in a high excess of air in the combustion flues. The condition of the producer is also often contributory to low setting temperatures as the fuel bed depth is allowed to fall below the required minimum, and long periods between successive fire-cleanings are permitted.

In attempting to regain temperatures when the necessity arises, the primary air is increased by opening the producer door in the case of horizontal retorts, when the ensuing high gasification rate results in heavy clinker formation. A further setback in retort temperature occurs. This sort of temperature fluctuation, combined with the necessity of charging with wet coal through lack of undercover storage, contributes considerably to the early deterioration of the retort brickwork, with the result that for some considerable period before the normal resetting time is due the retorts are in such bad shape that gas production from them becomes uneconomical.

With hand-drawn horizontals, the tendency is towards light charges to ensure ease of discharging. This produces a lower rate of gas evolution with consequent greater risk of overpulling and increased opportunity for overcracking. A reduced thermal yield again results and difficulties are met with high free-carbon content tar in the hydraulic and tar mains and blockages due to the increased formation of naphthalene.

The foregoing factors may be corrected by closer control, and without recourse to major additions or renewals of plant, to provide marked increase in carbonising efficiency.

Fuel Consumption

In drawing a comparison with larger works, the coke used in producers is proportionally higher for small works consequent on the greater heat loss by radiation per retort in the setting due to the small size of the carbonising plant. Thus for four vertical retorts arranged in pairs there is one cold major axis wall per retort, which necessitates the use of almost double the quantity of producer gas to heat these walls as compared with the requirements of the inner flues. In such circumstances it is therefore hardly possible to obtain a fuel consumption of less than 16% of the coal carbonised where for a similar but larger plant a figure of 11% to 12% could be expected.

For both horizontal and vertical settings a higher coke consumption, apart from that due to a lesser degree of control encountered on small works, may be due to the offtake of producer gas from the setting producers for dilution purposes. The amount of coke gasified in this way is not normally returned as a separate figure but is included in the fuel requirements of the setting. Other contributory causes of increased fuel consumption in the case of small horizontal benches are the use of quenched coke for charging the producer and a high percentage of carbon removed with clinker and ash.

Maintaining standby retorts under fire is a source of high fuel consumption, as in most instances one bed of horizontals or a pair of vertical retorts may be at least 25% of the plant available. Thus avoidance of standby plant by improved output from the plant in use results in a substantial saving in producer fuel.

In the case of vertical retort installations with pressurised producers, a considerable economy in fuel has been effected by the introduction of steam regulators of the Arca water-operated type for governing the producer venturi steam pressure. These are especially effective for small works where normally the steam pressure is very variable and fluctuations are such that reducing valves are unable to maintain a steady reduced pressure. For small vertical settings one producer is sufficient to supply producer gas requirements, and a variation of venturi steam pressure by only 2 or 3 lb. per sq.in. results in an extensive variation in producer gas pressure in the CO main where pressures are measured in hundredths of an inch water gauge. The elimination of these fluctuations by efficient governing produces an even gas pressure only disturbed by fire cleaning and producer charging operations, so that steady retort temperatures are maintained and control is so fine that small damper adjustments can be made with confidence that the desired results will be achieved. The producer gas requirements of the setting can thus be cut to a minimum and a satisfactory fuel consumption assured. A further advantage is also gained in those cases where producer gas is drawn from the CO main for dilution purposes either hand or automatically controlled. Pressure fluctuations due to variations in the volume extracted are instantly corrected by the steam regulator, thus ensuring an even pressure to the setting at all times.

Calorific Valve Control

The control of calorific value on small works is normally left in the hands of the stoker for something like 16 hours per day. Thus it is essential to provide a simple and adequate means of calorific value regulation which is at the same time consistent with good practice. Also, for the maintenance of constant quality, both make and town gas calorific value recorders should be situated as near as possible to the retort house or point of control and be readily visible at all times. The luminous indicators available for use with Sigma calorific value recorders have been found advantageous, especially in those cases where the recorder is unavoidably installed some distance from the retort house. In indicating changes in calorific value, they ensure that trouble is taken to observe the recorder to ascertain the extent of the change and the amount of correction necessary. A few of the old school of stokers still have great faith in the flame types of indicator as a means of showing high or low quality. These instruments may have a limited usefulness on the make gas stream, but they are generally to be disregarded.

As regards methods of calorific value control on small works it is found too often that regulation is by variation of pressure conditions on the retorts in both horizontal and vertical settings. While this method may be effective in controlling calorific value, the resultant periods of excess pressure or pull are a constant drain on therms per ton and are to be avoided wherever possible. Commonly adopted also, and almost as undesirable, is the regulation of air admission for calorific value control carried out

regardless of considerations of volume required for the purification process.

These methods have been resorted to where adequate control is available by adjustment to retort steaming or by regulation of dilution with producer or water gas. With control by retort steam as in vertical practice, and air admission maintained at a constant minimum, maximum therms per ton have been obtained provided that the optimum economical percentage steaming is not exceeded. The tendency is to steam excessively during periods of high throughput in an effort to reduce the quality sufficiently; but an increase in calorific value results due to excess of undecomposed steam, which prevents the rich uncracked coal gas from contacting the hot walls of the retort. It is a decided advantage in these cases, therefore, to make available either producer gas or externally produced blue water gas for dilution, preferably automatically controlled, and so avoid excessive steaming, overpulling, or dilution with air.

Instrumentation

Efficient plant operation is hampered on many small works by lack of instruments, especially of the recording type. Extensive instrumentation is not advocated, for with the limited technical supervision normally available, the less essential recorders and indicators become a superfluous complication. Recorders and indicators of real value in promoting correct conditions for the best plant efficiency are as follows:—

(i) Calorific value recorders on town and make gas. These require to be checked with a water-flow calorimeter usually at weekly, fortnightly, or monthly intervals, depending upon the known reliability of the instrument concerned.

(ii) Pressure-vacuum recorder graduated in 1/100 in. W.G. for recording pressure conditions at the retort offtakes. A recorder at this point is of prime importance as erratic conditions of pull and pressure frequently prevail on small works.

(iii) Vacuum recorder for exhauster pull. This is necessary for assistance in improving irregularities in exhauster governing which occur on small works due in some instances to large variations in steam pressure where steam-driven sets are employed or to the inefficiency of the exhauster itself. Such a recorder is also useful where the retort house governor demands a constant pull for its efficient operation.

(iv) A pressure-vacuum recorder for producer gas pressure is essential for the small vertical retort plant, whether natural draught or pressurised producers are installed. This recorder assists in ensuring economical working of the producer, and the maintenance of even retort temperatures, and also ensures that pressure conditions exist in the producer gas mains and uptakes in order to avoid local overheating due to air infiltration.

(v) A temperature and pressure gauge panel. The installation of a centralised panel is simplified on small works where normally the close grouping of plant ensures that only short pipelines are required.

Wet Purification

With a cheap water supply not normally available and the need for low capital cost and minimum maintenance, most small works have to rely on the atmospheric types of condenser for gas cooling. These provide efficient condensation during the coldest months of the year but are highly ineffective under warm atmospheric conditions, temperature drops from inlet to outlet averaging 32% of the inlet temperature for the latter with continuous vertical retort gas. The inevitable effect of inefficient condensation is the overloading of the washing plant which is in many cases already inadequate, and often one washer only is provided for removal of both tar and ammonia. A considerable quantity of tar fog finds its way to the oxide in these circumstances, and up to 25-30 grains of tar per 100 cu.ft. of gas have been detected at the washer outlet.

Electro-detarrers and static washers in use on small works are in the minority in comparison with other types, but where this combination is installed very satisfactory results are obtained, tar fog being eliminated and ammonia removed to the requirements of the oxide purifiers. By closer control of ammonia removal, the volume of water required for final washing has been kept at a minimum.

A poor standard of washing is also reflected in the high hydrogen sulphide content of the gas entering the purifiers. This may amount to 1,200 grains per 100 cu.ft. during the summer months, when a portion of this quantity may be due to evolution of hydrogen sulphide from the strong washing liquor. Such a high concentration may not be unduly disadvantageous in cases where the purifiers are of ample capacity, as the extra sulphur recovered has a monetary value, but in other cases it leads to increased costs due to more frequent changes of oxide.

Dry Purification

The performance of oxide purifiers varies considerably from one small works to another despite similar 'R' ratios, and use of the same oxide. This is due to the varying conditions under which purification proceeds, the dominant factors being the extent of air admission, the condition of the oxide when first put to work, and the frequency of box rotation.

Control of air admission was found to be generally haphazard, resulting in excessive oxygen contents of 3% to 4% in the town gas in some cases and insufficient amounts of 0.2% in others, dependent to some extent on whether air was used for control of calorific value. High rates of air admission led to rapid hardening of the surface layers of the oxide with consequent difficulty due to back pressure; and a deficiency of oxygen caused inactivity with resulting frequent changes of oxide through early fouling. More effective control of air has been secured by fitting fixed orifices of sizes related to gas makes and exhauster pull, for entrainment of the desired volume for purification requirements. Air admission in this way at the exhauster inlet has, however, the well-known disadvantage in that a portion of the oxygen content is absorbed in the mains and washers by tar and liquor before reaching the purifiers. Tests conducted to ascertain the extent of absorption in this way showed, as a general trend, that the absorption was greater where poor washing conditions obtained. Average examples of this are given in Table 1.

TABLE 1.

Inlet washer			Outlet washer			Washing liquor Average strength	
NH_3 Grains/100 cu. ft.	H_2S Grains/100 cu. ft.	O_2 %	NH_3 Grains/100 cu. ft.	H_2S Grains/100 cu. ft.	O_2 %	Free NH_3 %	°Tw
143	1,050	1.4	1.4	590	1.2	0.7	1.0
105	880	1.0	5.0	610	0.8	0.85	1.5
110	790	1.0	91.0	770	0.6	3.6	9.5
140	800	1.2	143.0	810	0.6	3.2	9.0

In Table 1, the first two examples relate to static washer performance with controlled water addition, whereas the last two examples are of Livesey type washers functioning as both tar and ammonia washers in which water addition is carried out only in order to replenish the level after draining-off tar. The efficiency of ammonia and hydrogen sulphide absorption is thus indicated in the two systems with the relative oxygen absorption in each case, and provides ample evidence of the value of direct air injection at the purifier inlet by means of an air blower. This method of air admission, combined with a metering device, ensures the correct oxygen supply for revivification *in situ* while keeping dilution of the make gas by air to a minimum.

Regarding the condition of the oxide before use, this, if part spent, is often acidic and *p*H values of 3.0 have been encountered, necessitating the addition of soda ash. Moisture contents are usually excessive if prepared during the winter months, since cover for revivifying floors is not normally found on small works, with resultant trouble due to fissuring of the oxide mass on drying out in the box. This may be corrected by the addition of a small proportion of dry sawdust immediately prior to filling the box. In those cases where inadequate washers cause contamination of the oxide with tar, it is advantageous to cover the top layer of oxide with a shallow filter layer of coke breeze, which can be removed separately when the box is opened for discharging.

GASHOLDER FOUNDATION DESIGN

PAPER TO THE SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT) BY

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THE main types of foundations are:—
(i) *Mass Concrete Foundation.* This is the simplest form and is used when a solid bearing stratum is found within a few feet of the surface and becomes a manufactured extension of that formation to the surface.
(ii) *Raft Foundation.* This is a method, as the name suggests, of more or less floating the load on a stratum of relatively low bearing value situated within a short depth from the base of the building.
(iii) *Pier and Beams.* If a suitable stratum is found at reasonable depth, piers are sunk at intervals and the loads carried over the intervening spaces between the piers by means of reinforced concrete beams.
(iv) *Piles.* Modern piles consist of concrete, reinforced with steel rods. These piles are sub-divided into different types to suit varying conditions.

The site for the Leven holder was chosen some years ago, the main obstacle in the building of the holder being that tenants had to be re-housed in a rapidly expanding area which had a large waiting list of names for new houses. To satisfy and conform with the plans of the County Planning Authority the exact site of the holder was definitely fixed, the perimeter being not less than 72 ft. from the works boundary wall at Riverside, and 24 ft. from the boundary wall at Carlow Place.

Basis of Design

The requirements were to design a foundation on this site to carry a gasholder of 750,000 cu.ft. capacity with an overall diameter of 112 ft. 7¾ in., the total load of the holder being approximately 15,000 tons resulting in the main in an even distribution of loading of 1 ton per sq. ft. In addition there was a concentrated load at the centre of 1 ton per ft. run directly beneath the holder shell, and concentrated loads of 12 tons on each of the 32 raised blocks placed round the perimeter.

Allowing for a small projection beyond the face of the holder, it was decided to make the diameter of the foundation 115 ft. overall. Having now the loading and the plan dimensions, the next step was to ascertain sub-soil conditions, which, of course, decided the type of foundation design subsequently adopted.

Following accepted procedure, bores were taken of the site in March, 1951. One bore was taken down a depth of 40 ft. while the others were taken down to 20 ft. below ground level. These bores were taken by the hand auger method, which provided a reasonably accurate picture of the sub-soil conditions. The information so gained by the bores decided the adoption of the type of foundation which it is believed will prove the best and least expensive.

Design Adopted

Two types of foundations were in mind (a) a raft and (b) a piling scheme. The choice between (a) and (b) could only be determined by taking out approximate schedule of quantities for the two methods and comparing costs. The soundest scheme economically was a raft slab, but the difficulty here was that for a depth averaging 5 ft. 3 in. below ground level the sub-soil was made up of forced material and soft clayey sand, which, of course, is not suitable for bearing purposes. Had the depth of this soft material been greater—*e.g.*, 10 ft.—then it would have been necessary to resort to a piling scheme, which would have added considerably to the cost.

It was considered that the depth of soft material being relatively small some compromise scheme should be adopted, and it was decided that the whole area of the site should be excavated to the surface of the gravel, this material being a sufficiently good bearing medium. Hardcore filling should thereafter be deposited and well consolidated to a thickness of 18 in., this material to be whinstone and suitably graded to obviate voids. The hardcore, when laid, was to be entirely covered with 3 in. blinding concrete to provide a hard, dry, clean surface on which to lay the reinforcement. The reinforced concrete slab would then be cast on top of the 3-in. concrete.

In regard to the thickness of the foundation slab, certain assumptions have to be made as to the pattern of possible settlement. It was clear that if the worst possible case was to be provided for, then a foundation of considerable thickness would have to be employed. However, providing the ground conditions are at least fair, then it is reasonable only to provide against small pockets of settlement here and there. The question of steel, therefore, in the case of slab on solid is really based on experience, and in this instance it was decided that a 15-in. slab, thickened at the perimeter to 18 in., would suffice, reinforced with ¾-in. square bars at 12-in. centres in both directions top and bottom. The allowable stresses were as follows: Concrete—1,000 lb. per sq. in.; steel—27,000 lb. per sq. in.

The inlet and outlet pipe pits were designed to be strong enough to carry part of the load of the main foundation slab directly above it, and in addition to resist the side pressure from the earth and ground water. The base slab was designed to span between the vertical concrete walls. The walls were designed to take a direct load and a bending moment. The same allowable stresses were applied as in the case of the main slab.

To facilitate excavation work it was decided to lay a perforated fireclay drain, which in addition would serve to take away any water which might accumulate around the base of the foundation. The level of this drain is above the ground water, and the drain will subsequently be connected to the works drainage system.

Progress of the Work

The demolition of the houses on the site commenced in April, 1952, and was completed at the end of May, 1952. The outside wall was left at a height of 8 ft. and joined to the existing boundary wall.

Excavation of the site for the foundation raft was commenced early in June, 1952. A mechanical digger was used for this work. The excavation was completed at the end of June, 2,020 cu. yds. in all being excavated, weighing approximately 2,723 tons. Bottoming of the excavation to the extent of 12 in. was next accomplished and a 10-ton road roller was used for consolidation. Preparations were made for casting the concrete slab in August. All levels were checked by theodolite, and the inlet and outlet pit chambers set out. A cement shed for dry storage of cement was erected.

During the excavation of the inlet and outlet pits, water was struck at 10 ft., so sheet piles and steady pumping had to be resorted to, to enable the pits to be concreted. While these pits were in the course of construction the steel fixer was laying the reinforcing steel bars on the 3-in. blinding concrete. The top and bottom layers of steel were kept apart by the use of stool or spacer bars, and the whole was wired together to provide a reasonably stiff framework. The bottom bars of the arrangement were kept clear of the blinding concrete by placing cement packing pieces 1½ in. thick underneath. This was to ensure that the steel had the necessary cover of concrete, which was 1½ in. The top bars of the reinforcement had similar cover. The perforated drains were laid in the track dug, and connected to the works

drainage system. Approximately 120 tons of cement was used, 240 tons of sand, and 480 tons of aggregate.

The reinforced concrete slab was completed in mid-October, 1952. The contractor had to contend with irregular delivery of cement and aggregate due to short supply. The mixtures used were 1:1½:3 and 1:2:4. The works technical staff took slump and cube tests (in accordance with British Standard Specifications) of each sector during casting. Each cube was dated and numbered and sent for testing.

The gasholder when completed will be 2 ft. 3 in. below ground level, and in order to protect the face of the holder below ground level against corrosion a waterproof membrane is to be sweated on to the steel, and thereafter this is to be encased by a 4-in. thick concrete wall brought up to 3 in. above yard level. This wall is to be connected to the foundation by means of steel dowel bars.

I would thank Messrs. Macdonald Partners, the Frank Concrete Company, and the works staff for their assistance in the compilation of this paper.

WORKS RE-ORGANISATION

PAPER TO THE YORKSHIRE JUNIOR GAS ASSOCIATION BY

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M.Inst.Gas E.

THE re-organisation described in this paper concerns the New Wortley works of the Leeds Group of the North Eastern Gas Board from 1949 to the present time. In 1949 we had working 27 beds of horizontal retorts, which, with producer gas dilution, gave us 4.8 mill. cu.ft. per day, and 22 beds of inclined retorts which gave 2.2 mill. cu.ft. per day—a total of 7 mill.

Owing to the inability to get new plant during and immediately after the war years, the inclined retorts, although having been deemed redundant, had to be worked to capacity to meet the increasing demands, while a new 2½ mill. cu.ft. per day carburetted water gas plant was ordered to replace them. This plant, along with complete ancillaries including vertical water tube condenser, 100,000 cu.ft. relief holder, exhauster, electrostatic detarrer, naphthalene washer, purifiers, and meter, was first put to work during December, 1950.

On the advent of nationalisation it was apparent that re-organisation was necessary, and a master plan was evolved by the Chief Engineer to the Board and his assistants, with the co-operation of the Leeds Group General Manager and his staff. This plan, although not followed in complete detail, has been that on which the development of the New Wortley works has been based.

Owing to the increasing demands for gas and the rapid deterioration of the inclined retorts, it was decided to plan for, and to place on order, a second 2½ mill. cu.ft. per day carburetted water gas plant, and consequently the original layout had to be modified. The carburetted water gas house was re-designed to incorporate the two plants, the gas mains were increased from 24 in. to 30 in. diameter prior to relief holder, a new exhauster house with provision for two exhausters and meters was designed complete with control room and calorimeter room, provision was left for a second de-tarrer, and the purifiers were re-designed to give two sets of three boxes instead of four boxes and a catch box. The latter project involved the extension of the purifier foundations, the boxes being set below ground with the covers at ground level. This work was carried out by direct labour.

The laying of the 30-in. inlet relief holder main, of some 210 yards, necessitated a crossing being made of Wellington Road, which bisects the works, and this operation was carried out on two successive week-ends, first to the centre of the roadway and then to the farther side, which enabled the traffic to be continuous, including the tram cars.

New Carbonising Plant

While the No. 1 carburetted water gas plant was under construction, a new 5 mill. cu.ft. per day carbonising plant was planned, and demolition of an old retort house some 250 ft. long and 70 ft. wide was begun in January, 1950, to make room for its construction. Along with this demolition, the electricians shop and store and welders shop had to be resited, a 6-in. steam line from the existing Lancashire boilers re-routed, and a 24-in. overhead steel foul main from the horizontal retort house demolished.

The site was cleared and the bench and house foundations for two benches of intermittent vertical chamber ovens, each of 25 chambers, to be built by W. J. Jenkins, Ltd., of Retford, were begun in May, 1950. These foundations were completed in March, 1951, the erection of steelwork commenced at the beginning of July, and one bench was put to work on December 29, 1952.

As this was proceeding, other stages in the development of the re-organisation were progressing.

The addition of 2½ mill. cu.ft. per day from the No.1 carburetted water gas plant saw us safely through the winter of 1950-51, after which No. 1 bench of 11 beds of inclined retorts ceased gas-making, demolition commenced in April, 1951, and foundations for two sets of purifiers were begun in October of that year, using the existing inclined retort house structure as purifier housing. These boxes, 35 ft. by 30 ft. by 6 ft. in two sets of four of cast iron construction supported on a steel structure giving 16 ft. headroom, were designed to take the gas from the projected intermittent vertical chamber oven plant, were of 5 mill. cu.ft. per day capacity, and were due for completion in the autumn of 1952.

A Year of Intense Activity

The year 1952 was one of intense activity. Not only were the main contracts being urged for completion for the winter, but subsidiary contracts, necessary for the change-over, were proceeding at the same time. These, in brief, were:—

(a) Road and rail borne coal handling hoppers, wagon tippler, and coal conveyors and elevators for the intermittent vertical chamber oven plant.

(b) Some 185 yards of double-rail approaches to tippler.

(c) Coke conveyor gantries from the intermittent vertical chamber oven plant to existing screens.

(d) The building of a 57,000 gal. per hour water cooling tower with the laying of water re-circulating mains to condensers, etc.

(e) The erection of three 3 mill. cu.ft. per day vertical water tube condensers, one to each of the intermittent vertical chamber oven benches and one in the horizontal gas stream.

(f) The installation of two 6 mill. cu.ft. per day electrostatic detarrers and two similarly sized static ammonia washers.

(g) The demolition of a twin set Beale type exhauster and the substitution of a 300,000 cu.ft. per hour Connersville exhauster.

(h) The installation of a 10.8 mill. cu.ft. per day Connersville meter.

During this period too, the culmination of the change-over from two to three phase electric supply took place, a new sub-station having been built and an 11,000 volt supply cable laid during the previous year. The erection of the second 2½ mill. cu.ft. carburetted water gas machine was also begun in April and successfully put to work during November, 1952.

To achieve this metamorphosis in such a relatively short time and to maintain gas production at a high level over practically the whole period, with very few opportunities for complete shut-downs due to the inadequacy of existing gas-making plant, involved no little ingenuity in both planning and execution.

The ultimate design is that all the coal gas produced should travel via the new washing plant and purifiers on to inlet holders on the east side, but this cannot be possible until further purifiers are erected alongside those recently put into commission. The two sets erected will be sufficient to handle the 5 mill. cu.ft. from the completed intermittent vertical chamber ovens plus some proportion of the 4 8 mill. cu.ft. horizontal coal gas; but the remainder, probably some 3.5 to 4 mill., will have to be treated in the existing purifiers until the second purifier installation is completed in about 1955.

The total coal gas make at the beginning of March, 1953, was 43 mill. cu.ft. from the horizontal plant, and 2.2 mill. cu.ft. from the intermittent vertical chamber oven plant—a total of 6.5 mill. which would have to pass through the new mains system while the changes for reversal were made. The new purifiers would therefore be approximately 30% overloaded for this period, so it was necessary to push ahead with the reversal, particularly as the second bench of intermittent vertical chamber ovens was being brought up for gas-making for the latter part of March.

The whole of the coal gas was put through the new system on March 9 and the old washing plant, purifiers, and Connersville meters were isolated.

All was completed by March 21. Maximum cleaning had been carried out in the purifiers and old inlet valves and mains, as it is obvious that in reversal these would become outlets, and the risk of the purified gas being re-contaminated on passing through the previous inlet mains was always apparent. Hence the complete renewal of oxide in one box in each set, this being put as last taker on the reversal. In actual practice, it was found that there was some re-contamination of the purified gas which persisted for some time, and, to prevent this passing into the holders, the gas was pulled by means of a cross-connection and valve from this reversal main back into the inlet exhauster main and thus re-circulated through the purifiers.

The completion of this final stage of the re-organisation enabled the second bench of intermittent vertical chamber ovens to be put to work on March 24, which brought the daily capacity of the works up to 9.5 mill. cu.ft. of coal gas and 5 mill. cu.ft. of carburetted water gas.

TRANSPORTATION OF LIQUID PETROLEUM GAS

FEW PEOPLE, suggested Mr. E. A. Jamison, of the Gulf Oil Corporation, at a recent conference in Montreal of the Liquid Petroleum Gas Association, realise the influence that freight rates have in determining marketing areas for liquid petroleum gas. In the United States more than 40% of the liquid petroleum gas consumed can be accounted for in four south-western producing States—Texas, Oklahoma, New Mexico, and Louisiana.

Pipelines, he pointed out, can be and in some cases are being used to move liquid petroleum gas much more cheaply than by rail. However, it is economically justified only where very large volumes are involved and ordinarily where relatively cheap underground storage is available at both ends. 'Unfortunately,' commented Mr Jamison, 'nature didn't provide us with the right kind of formation for underground storage at the right places for the most part. There is an additional expense in these cases for moving these large volumes to distributors' bulk plants for redistribution to the customer.' Some liquid petroleum gas is at the moment being left in natural gas for transmission by pipeline and removed close to large consuming areas; some is being moved with crude and stripped at the refineries.

Mr. Jamison concludes that, if the market is to continue to grow in volume and spread in area, it will be necessary to find a means of getting lower freight rates or else resort to some other method of transportation. In other words liquid petroleum gas cannot compete for many markets chiefly because of transportation costs.

SCIENTIFIC RESEARCH IN U.S.A.

THE British Commonwealth Scientific Office in Washington is maintained to facilitate the exchange of scientific and technical information between the United States Government and the British Commonwealth. The Office includes scientific missions from the United Kingdom, Canada, Australia, New Zealand, and South Africa, each mission being independent and responsible only to its parent government. The missions co-operate whenever necessary for the purposes of liaison and they share office premises and common services.

The B.C.S.O. prepares an annual review of scientific activity in the U.S.A. Now, however, we have the first publication—'Science in U.S.A.' (H.M.S.O., price 2s. 6d., by post 2s. 7½d.). It has been produced jointly by the five scientific missions concerned.

Expenditure on research and development in the United States has grown rapidly during the past 10 years, most of the increase being devoted to military projects. The amount spent on research and development increased by 270% during the past decade. The Federal Government itself employs directly some 91,000 science and technology graduates, more than half of them being engineers. Of the total, some 58,000 are employed on research projects. The figures do not include scientists working in factories and laboratories operated for the Government by outside bodies.

It is estimated that $530 mill. will be spent on research in all faculties in universities during the year 1952-53, and more than 80% of this sum will be provided by the Federal Government in the form of grants or contracts. The balance will come from state authorities, industry, and philanthropic foundations. Educational authorities anxious to preserve a balance between the arts and the sciences in university post-graduate schools are reported to be worried by the heavy bias of university research in favour of science and technology. The distribution of the large sums available for the sciences also presents problems. The greater part of these will be used for the investigation of problems of applied science. Thus it is feared that there may be a lack of balance between the efforts devoted to applied science and to pure science, which is the primary business of the university.

Again, there is grave concern that the output of graduates in science, and particularly in engineering, may not be sufficient to meet the needs of industry. Industry demands more and more graduate engineers, but authoritative engineering bodies suggest that this demand could be largely met by preventing the drain of engineers to non-professional work and by increasing the effectiveness of the engineers already in industry.

Two of the principal Government bodies concerned with the encouragement and co-ordination of science are the National Science Foundation and the Inter-departmental Committee on Scientific Research and Development.

The National Science Foundation was set up to develop a national policy for the promotion of basic research and education in the sciences and it has now been in existence for over a year. The Foundation has inaugurated a programme of fellowships and research grants, though the programme is limited by the fact that the Foundation received an appropriation of only $3½ mill. during 1952, as against the $14 mill. requested. The Inter-departmental Committee on Scientific Research and Development, which consists of representatives of the armed forces, the Atomic Energy Commission, and other Government departments and branches, has been in existence since the end of 1947.

It is estimated that the United States will consume in 1975 double the energy used in 1950. This increase will continue a trend that has existed since the start of the century. Taking an index of 100 for the energy used in 1900, the consumption in 1950 was 445. On the same basis production had reached a figure of 472 by 1950. The sources of energy have changed notably in the past 50 years. Today coal provides less than half the energy requirements of the country. In 1900 it supplied 90%. The fall is due, of course, to the rapid expansion in the use of oil. There is little pessimism at present about an immediate shortage of oil, for the discovery of new supplies has more than kept pace with increasing consumption. It has been estimated that the first commercial oil-from-shale plant may be brought into operation by 1960.

DRESSER ADJUSTABLE LEAK CLAMPS

HEWITT CONSTRUCTION, LTD., of 39, Victoria Street, London, S.W.1, who have acted as distributors of Dresser clamps for many years, have recently entered into an agreement with Dresser Manufacturing Division of America, who are extending their activities in the United Kingdom and Europe, and the former are now appointed sole manufacturers and distributors of Dresser products for the repair and maintenance of gas and water mains.

DEVELOPMENTS IN THE WALES AREA

PAPER TO THE WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION BY

E. M. EDWARDS,

M.Inst.Gas E., M.I.Mech.E., Member, Wales Gas Board.

THE area of supply of the Wales Gas Board embraces the whole of Wales and Monmouthshire, approximately 8,000 sq. miles of an area complex in physical features. More than one-half of the estimated total population of 2,587,000 live in the mining valleys and port towns of Glamorganshire, Monmouthshire, and Carmarthenshire. About one-quarter of the total population reside in the North Wales coastal resorts and the industrial region from Wrexham to the Dee Estuary. The rest of the Principality is substantially rural in character; nevertheless the small market towns, often with industrial establishments, play an important part in the life of the community. Population density varies from 43.1 persons per sq. mile in Radnorshire to 1,471 persons per mile in Glamorganshire.

At vesting day 105 of the 108 operating gas undertakings in the area came under the Board's administration, together with three water undertakings. Three gas undertakings—namely the Bute Docks undertaking, Cardiff, owned by the British Transport Commission; Tondu, owned by the National Coal Board; and Ebbw Vale, owned by Richard Thomas & Baldwins, Ltd., remained outside the provisions of the Act. The first of these has now been transferred to the Board.

The distribution of gas demand was approximately as follows:

Number of Undertakings	% of Total Gas Supplied	Location
37	77.7	South Wales Development Area.
18	14.0	Wrexham to Deeside and North Wales coast.
50	8.5	Rural areas and market towns.

At, or soon after, vesting date gas was being manufactured at 91 undertakings, the remaining 14 being supplied entirely in bulk with gas from coke ovens or gasworks. Table 1 is an analysis of the manufacturing plant at undertakings at May 1, 1949, and at March 31, 1953.

TABLE 1.

Description of Plant	Number of Undertakings making gas at May 1st, 1949	Number of Undertakings making gas at Mar. 31st, 1953
Continuous vertical and intermittent retorts, including C.W.G. where used	20	19
Fully mechanised horizontal retorts, including C.W.G. where used	7	4
Stop-end horizontals, including diluent gas	61	48
Complete gasification	1	2
Butane air	—	1
Other gas-making plant	2	5

Cardiff, the largest undertaking, had an annual output 1,500 times that of the smallest, Presteigne.

At April 1, 1949, coke oven gas was being supplied to the undertakings in the first column of Schedule A below from the sources shown in the second column.

Bulk supplies of coke oven gas, or gas manufactured at gasworks, were being provided by the undertakings in the first column of Schedule B to those in the second column.

Major grid schemes had been formulated by working parties, whose excellent work has been of great value to the Board, proposing large-scale integration of gas supplies in the Eastern and Western districts of industrial South Wales. These schemes were based upon coke oven gas supplies from the N.C.B., Nantgarw, the Steel Company of Wales, Port Talbot, other coke ovens, and gas supplies from large gas-making plants at centralised gasworks, including the new works under erection at Pontypool.

The condition of undertakings reflected the influence of two major factors:—

(i) The severe economic depression in the industrial districts prior to 1938, when undertakings were faced with constantly diminishing revenue.

(ii) The abnormal war conditions from 1939 onwards, when maintenance, renewal, and extensions were difficult. (In the South Wales development area gas demands increased from 5,752 mill. cu.ft. in 1938 to 11,543 mill. cu.ft. in 1948.)

Condition of Undertakings at Vesting Day

An early survey revealed that at some undertakings a high standard of gas supply was being provided, and adequate provision for the future made. Nine new gasholders were being erected, and a further seven had been ordered. New gas-making plant was under construction at Denbigh, Connah's Quay, Pontypridd, and Newport, and extensions were ordered for Llanelly, Colwyn Bay, Wrexham, Monmouth, and Kidwelly. The new gasworks approaching completion at Pontypool was an outstanding example of modern practice.

The general picture was, however, a serious one. Twenty-seven undertakings were in danger of being unable to meet their consumers' demands during the 1949-50 winter. Thirty-two gasholders were either unsafe or unsound. In addition to the 16 gasholders under erection or ordered, increased storage was urgently necessary at a further 14 undertakings. Purification plant was inadequate at 31 gasworks. Twenty-seven station meters were either grossly incorrect, or not registering at all. Mechanical plant, in many cases, was obsolete in design and suffered from lack of maintenance. Standards of painting and general cleanliness at many works were not good.

Gas distribution systems in some instances were good, but in many cases this was not so. Pressures at peak periods were often inadequate. This was due to increasing demands overtaxing the systems, limitations of gasholder pressures, absence of necessary gas boosters, condition of station governors, and in some instances deposits of naphthalene, or internal corrosion.

The total loss due to unaccounted-for gas was high, although in many undertakings low figures were experienced. In three undertakings it exceeded 30%, and in

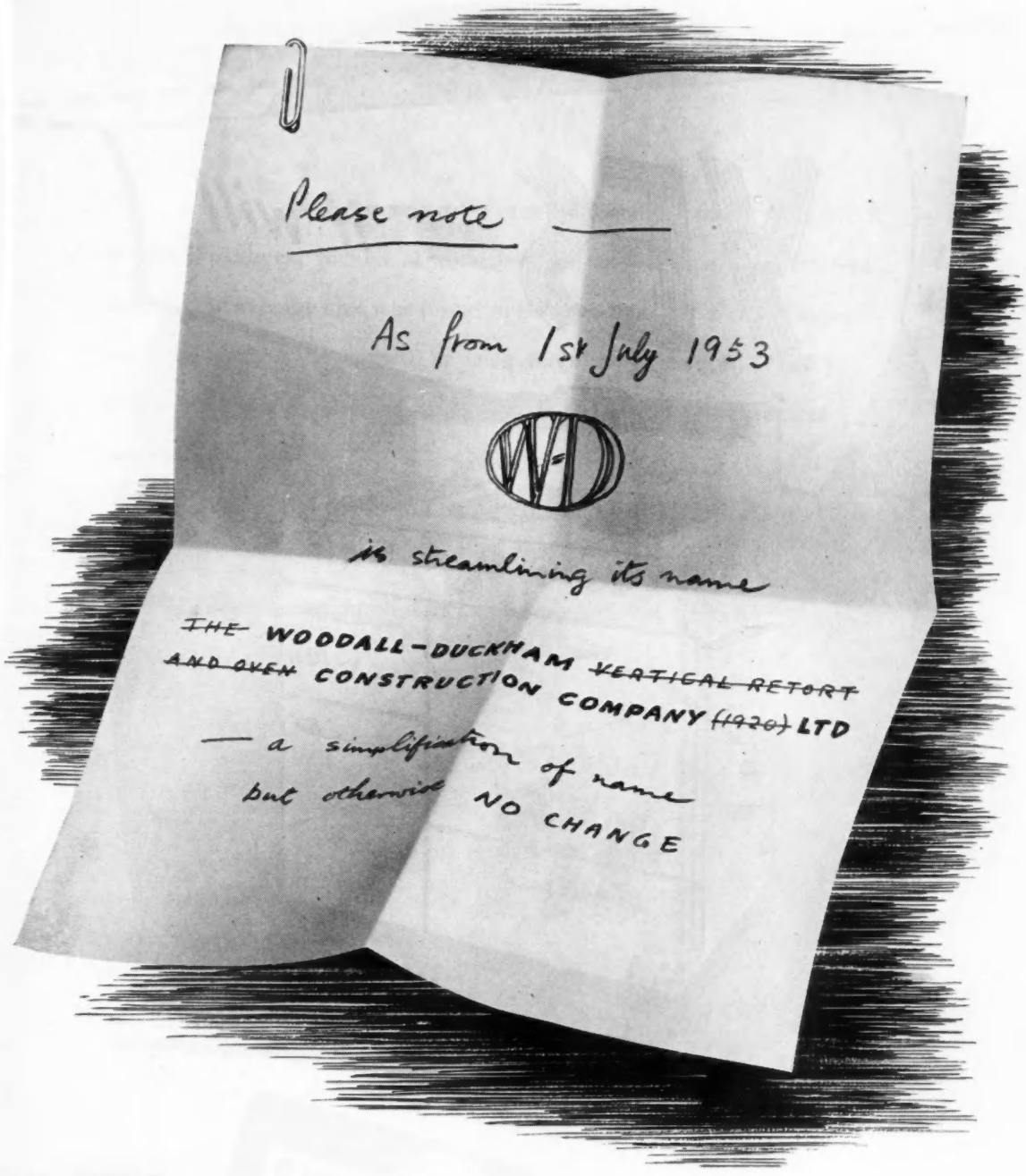
(*Continued on p. 289*)

Schedule A

Undertaking	Supplier	Annual quantity supplied in mill. cu. ft.
Cardiff	Guest Keen Baldwins	2,701
Garw & Ogmore	National Coal Board (Tondu)	179
Newport	British Benzole & Coal Distillation Co., Ltd.	1,233
Pontypool	Blaenavon Company, Ltd.	597
Pontypridd	National Coal Board (Maritime)	515
Port Talbot	Steel Company of Wales, Ltd.	767
Rhymney & Aber	National Coal Board (Bargoed)	723
Rhondda	National Coal Board (Coedely)	450

Schedule B

Supplying Undertaking	Receiving Undertaking
Newport	Chepstow and Caldicot
Pontypool	Abercarn, Brynmawr, and Blaina
Rhymney and Aber	Bedwellty, Mynyddislwyn, and Quakers Yard
Port Talbot	Bridgend
Neath	Pontardawe
Cardiff	Newport and Barry
Connah's Quay	Hawarden
Penmaenmawr	Llanfairfechan
Milford Haven	Neyland
Garw & Ogmore	Bridgend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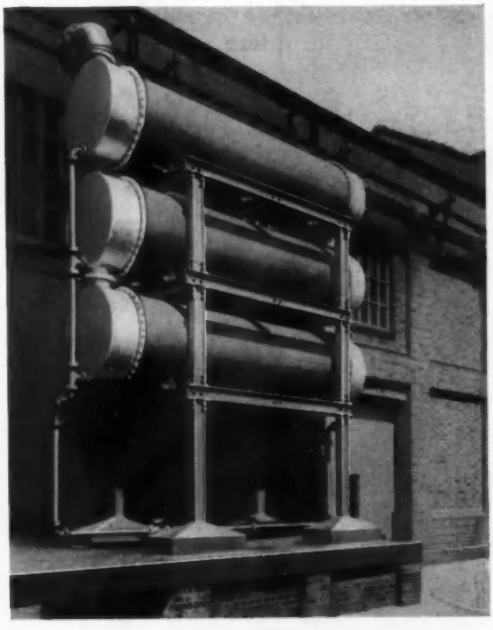

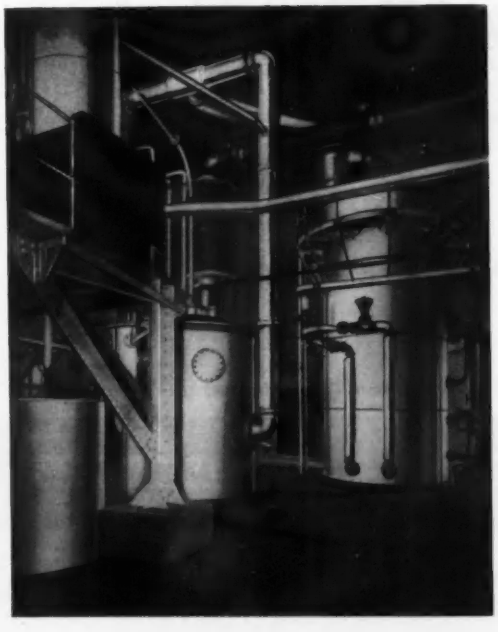

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Above. View of Roystons stainless steel Pre-heaters at Leeside Works, Tottenham.

Below. General interior view of Roystons Sulphate of Ammonia Plant at Leeside Works, Tottenham.

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a further 33 it exceeded 15%. Leakages from gasholders, inaccurate registration by consumers' meters, and leakages from mains and services were the principal causes. Subsidence in mining areas, with consequent damage to underground pipe systems, added to the difficulties of the problem. Although many undertakings were being operated at high standards of efficiency, there was generally great scope for improvement at both small and large undertakings.

Initial Programme

Included in the problems that demanded attention were:

(i) Immediate action to enable undertakings to meet their demands for the winter of 1949-50, and for the period that would necessarily elapse before major projects could be planned and completed.

(ii) Immediate action to improve standards of gas quality and supply to consumers.

(iii) Immediate action to improve operating efficiencies.

(iv) Acceleration of the construction of production plants and interlinking mains that were already authorised.

(v) The authorisation and construction of further interlinking mains where this was clearly economically sound, and where this could be arranged so that it would form part of later major schemes.

(vi) An examination of all existing and potential sources of gas supply in the Wales area.

(vii) An investigation into the extent to which centralisation of gas manufacture and schemes of interlinking or of gas grid construction could economically be justified.

(viii) An examination into the economics of possible improved methods of gas production and distribution to meet the needs of undertakings remote from large stations, and in respect of which interlinking was unlikely to prove economic.

The limitations of time preclude more than a brief description of the measures taken.

Within two months of vesting date bulk orders for refractory materials and ironwork for plant of standard design were placed, and the most urgent cases of retort resetting were met from this pool. During the first year orders were placed for extensions of gas-making plant at 10 undertakings, and resetting of existing carbonising plant authorised at 31 others.

A register of surplus plant of all descriptions at each undertaking was quickly prepared, and many needs for extensions and replacement of obsolete plant were thus met without the delay and expense associated with the installation of new plant. The operation of this register has been of very great value.

The necessity of improving standards of technical control, especially for the smaller undertakings, was met by establishing a Technical Advisory Service at Group level. In addition to the technical staff permanently stationed at the larger undertakings, the smaller undertakings were served by travelling technical assistants who were able to provide regular reports upon gas quality, plant operation, effluent disposal, and were also available to advise upon improving carbonising efficiency and standards of gas supply.

Mobile Repair Squads

The immediate programme of urgent work resulted in the formation of mobile repair squads, under the Board's Mechanical Engineer, to undertake gasholder repair work, repairs to mechanical and ancillary plant, and the transfer of plant from one works to another. The staff employed includes foremen, welders, riveters, fitters, electricians and mates. Equipment includes transport and a wide variety of mobile plant. Central stores and workshops are at Cardiff.

The type of work carried out is varied and extensive, and part of the work performed includes:—

(i) The repair of gasholders of capacities from 10,000 to 1 mill. cu.ft. Many repairs are major, involving the placing of the holders out of service and the re-sheeting of lifts, fabricating and fitting new cups and grips, and tank and guide framing repairs. Frequently, substantial repairs are carried out while the gasholders remain in service. Electric welding is extensively practised, but in its application care has to be taken by reason of the risk of ignition of escaping gas. Cup and grip skirting plates have been substantially repaired while the holders remain in use, and the welding of large patches upon the crowns and side sheeting is quite normal work.

Repairs are at present being carried out by means of stud welding to a 120,000 cu.ft. capacity gasholder that cannot be placed out of service. Corrosion has advanced too far, and the sheets are too thin for normal welding methods. A large number of bolted patches have already been fixed by means of stud welding, and it seems we shall be able to repair the holder so that it will serve until a new one can be installed. The use of stud welding for this purpose is a new development.

High Pressure Storage

(ii) A number of high pressure gas storage plants have been installed at undertakings in Wales by the Mechanical Engineer's Department. These plants consist of an electric motor or diesel-engine driven compressor, capacity usually 3,000 to 6,000 cu.ft. per hour at a pressure of 80 lb. —100 lb. per sq. in. The gas is pumped into receivers which in our case are converted 30 ft. by 8 ft. or 30 ft. by 9 ft. Lancashire boilers with the furnace tubes blanked off and large holes cut through the tubes to allow of the full capacity of the boilers being used.

A high pressure storage plant is usually installed when an undertaking has only one holder and it has to be taken out of service for repair. High pressure plants are also installed at undertakings where the gasholder storage is insufficient and where space is not available for additional low pressure holders or cost and length of delivery out of the question. Permanent high pressure plants have been and are being installed at Hay-on-Wye, Portmadoc, Amlwch, Towyn, Maesteg, and Welshpool. The plant usually consists of two or four 30 ft. by 8 ft. receivers, two compressors, the size varying according to the gas output at the works, one compressor being motor driven and one diesel engine driven, the latter being installed as standby for electricity supply load shedding or failure of supply. High pressure reducing governors are installed in order that gas can, if necessary, be supplied direct from the high pressure receivers or holders.

(iii) Improvements to various forms of power plant, including the installation of electrically driven equipment at some 20 works. Electrical equipment, including lighting, is usually flameproof.

(iv) The dismantling and re-erection on other sites of two gasholders.

(v) The installation of new, or transference of, plant such as:—Condensers (3); exhausting plant (20); wet purification plant (3); booster and compression plant (12); station governors (10); station meters (11). The figures in brackets indicate jobs performed since vesting date.

Moving a Holder by Sea

Considerable ingenuity is shown in dealing with the many diverse problems, both small and large. One unusual problem now under investigation is the transference of a high pressure gasholder from Conway to Bangor. This gasholder has a releasable capacity of 100,000 cu.ft., with an operating pressure of 60 lb. per sq. in. Its bulk is such that it cannot be conveyed by road without dismantling, and the possibility is being examined of removing the holder bodily from the existing site, placing it in the sea, and towing it through the Menai Straits to Bangor, where it would be removed from the sea.

I view the work of all engineers as being of particular importance in prolonging the efficient and economical life of all forms of existing plant. Much of this plant was constructed during periods when money was cheap and costs of materials and labour much lower than we are likely to see again during our lifetime. The replacement of this plant at present-day levels of cost must, by reason of enhanced capital charges, add to production and distribution costs; therefore, its preservation is of prime importance.

(To be continued)

IN PARLIAMENT

Domestic Coppers

Answering a question by Mr. A. R. Hurd, who wished to know whether it is necessary to insist on the installation of a copper for washing clothes in every case where a grant-in-aid is sought under the Housing Act of 1949, Mr. Marples said that the Minister did not insist on a copper being installed. Mr. Marples made it clear that the Minister could insist but had the power not to do so—a power which he was always ready to exercise in appropriate cases.

This must have relieved the apprehension of some of the prospective occupiers of houses which comprise these cases. Were they to be forced to accommodate a copper in the restricted area of the kitchen, the latest thing in streamlined electric washing machines might have to be put in the parlour, there to create in the minds of the guests at the house-warming a suspicion that their host might be slightly ostentatious.

Insulation of Buildings

During the debate on Science and Productivity, on July 20, Mr. R. R. Stokes had quite a few things to say about the possibility of British industry utilising insulating practice to effect a saving in fuel consumption. He believed that 'in the industrial field alone we could save something of the order of 10 million tons of coal a year.' From early childhood, whenever we have felt impelled to think of something really impressive in the way of numbers we have always thought of 10 million. Not until we heard Mr. Stokes dallying with our pet number in the House did we begin to suspect that our passion for 10 million was shared at such a high level. But we must point out that we have never haggled over our figure—never has our courage sagged enough to make us play for safety by prefixing our figure with 'something of the order of.' Maybe in our childhood the phrase had not been coined.

But it could be wrong to conclude that Mr. Stokes was not handling figures in the best party manner, for he proved his particular ability in this direction with the following: 'A firm whose fuel bill was £10,000 a year, by insulating the big tin and iron structures in which the greater part of the engineering industry works, reduced their fuel bill by £3,000 a year, or 500 tons. On the spending of £14,140 the annual saving is now £2,900, or practically one-third of the fuel bill of £10,000 a year.' It would be trying human nature too sorely to ask us to forego the delight of analysing that statement. Let's start with the figures: We follow without undue strain that if a firm saves enough coal by insulation, they may quite well reduce their £10,000-per-year coal bill to £7,000. But we are intrigued by our inability to understand (a) why the same firm should now be spending £14,140, and (b) why they should manage to save only £2,900. It looks as though they are now saving a bit less by burning about twice as much. The fact that the saving of £2,900 is practically one-third of the fuel bill of £10,000 is illuminating. We judge the company's management to be eagerly awaiting the time when, through increased consumption or higher price, they will spend three times as much and so save the entire fuel cost of £10,000.

Mr. Stokes's reference to 'the big tin and iron structures' gave us a terrible jolt. Like most Britons we have derived great satisfaction occasionally from hearing our country's engineering achievements spoken of in glowing terms. We are appalled to learn that the feats have to be achieved in 'big tin structures.' Our only consolation arises out of Mr. Stokes's remarkable forbearance in not saying 'little tin structures.'

There must have been some soul-searching by those members who have spent a deal of their colleagues' time during the past weeks dilating on the value of space-heating appliances to save domestic fuel, for Mr. Stokes had this to say on the subject: 'What we are going to save in domestic fuel is pure chicken-feed. If we succeed in making the domestic user save fuel in one way, he will immediately burn it up in another way, and we shall not get anywhere.' Our chickens are worried: they thought pure food for the feathered world went out of fashion permanently with the birth of some egg marketing scheme which paid a higher price for cod-tainted yokes and oak-flavoured whites; now they fear it may return in the guise of coal dust. The domestic user, too, is worried—or to be more accurate, irritated. He makes no claims to sainthood but he sees no reason why Mr. Stokes should imply that any domestic user will, by 'immediately burning it up another way,' sabotage official efforts to save fuel. Mr. Stokes's phrase, 'and we shall not get anywhere' is not the least constructive phrase in his exposition on industrial fuel saving. We must admit it implies lack of movement, with the consequent saving in the fuel which modern transport has a habit of consuming when pressed into service.

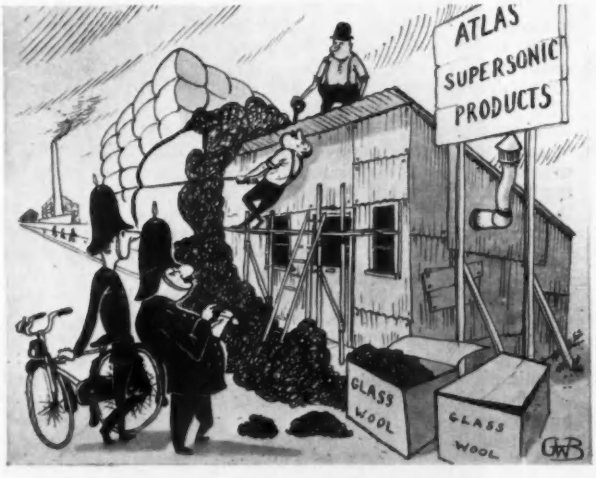
Although nobody will disagree with Mr. Stokes's contention that industry should be encouraged by practical measures to save fuel, one must feel that Mr. Stokes would facilitate the endeavour if his metaphors were more wisely chosen and his statistical examples made more digestible.

But let us not be too hard on Mr. Stokes. He is capable of uttering sublime profundity. In the same debate he said: 'The important thing in getting production up is to have everybody interested in increasing it. The person who slings things on to trains, for instance, can affect production enormously.' And how!

Electricity Load-Spreading

Sir Walter Monckton, Minister of Labour, replying to Mr. Nabarro, said that the committee has been considering electricity load-shedding next winter. Its report will be published during this week. Mr. Nabarro asked the Minister to draw the attention of both sides of industry to the grave shortage of house-coal which is likely during the winter and the probable consequent heavy demand for electricity for domestic uses and the resultant interference with industrial production. The Minister replied that both sides of industry already have the point well in mind.

Mr. Timmons asked the Minister of Fuel and Power if he will appoint a committee to inquire into costs of coal distribution. The Minister replied that he does not consider the appointment of such a committee is necessary or desirable at the moment. No doubt Mr. Geoffrey Lloyd will, in due course, be asked to say why he does not think the appointment desirable.



'I would go further and enact some legislation, making it a penal offence not to have insulated a building'

(Mr. R. R. Stokes, in the House of Commons, July 20)

News in Brief

Scholarships.—The British Tyre & Rubber Co., Ltd., has endowed scholarships at the National College of Rubber Technology in London which will be known as 'B.T.R.' Scholarships. A scholarship will be awarded annually, and each will be for three years and valued at £300 per annum.

The Duke of Edinburgh has graciously consented to be Patron of the International Scientific Film Association conference to be held in London from September 18 to 27. The conference will take place in the National Film Theatre and the Royal Festival Hall. Scientific films will be displayed from all over the world.

Steel Co. of Wales.—Work on the construction of a new cold reduction plant at Velindre, Llangyfelach, near Swansea, is to start in the near future. The plant is expected to take some years to build and preparatory work has been going on for some time on the site. It is part of the Steel Company of Wales' £40 mill. modernisation scheme.

Window Envelopes.—A recent Post Office examination into the delay in delivery of aperture and window envelopes has revealed that the chief causes are due to senders who fold the contents badly, and partly obscure the address, cram the envelope full, which results in tearing when it passes through the stamping machines, and write the address indistinctly on coloured paper.

Finnish Imports of solid fuel were much lower in the first quarter of this year than in the corresponding period of 1952, amounting to 239,095 metric tons of coal and 68,110 tons of coke, compared with 428,317 and 118,714 tons last year.

Flavels of Leamington gave one of their latest model gas cookers as one of the prizes at the recent Press Club ball. The number of the winning programme was 91, and although it was repeatedly broadcast no claimant appeared. A re-draw resulted in the cooker being presented to Mrs. R. W. Flower, of Mill Hill, who said the lady who should have won the cooker had her programme upside down and was waiting for 16 to be called.

'Fire Research, 1952,' has just been published by H.M.S.O. for D.S.I.R. and the Fire Office Committee, price 3s., by post 3s. 1½d. In this report it is mentioned that one fire in six was associated with electricity. It is pointed out, however, that the majority of fires caused by electrical equipment may be due to misuse of the equipment. A special enquiry into fires originating in electric cookers, for instance, showed that in only 6 of 814 incidents was the cooker, its leads, or its switches to blame The vast majority of the fires was caused by carelessness or incompetent handling of the electrical apparatus. The element of potential danger, however, remains.

The Scottish Gas Board is paying £100 a week for road tankers to take ammoniacal liquor refuse away from Hawick gasworks and so avoid pollution of the River Teviot. But the plan is not foolproof. At Hawick Sheriff Court, James Wilkinson, gasworks foreman, was fine £5 for allowing a quantity of ammoniacal liquor refuse from the gasworks to flow into the river. The Gas Board's agent said that since a similar case last year the Board had done everything in its power to prevent a seepage of poisonous liquid into the river. On this occasion the pipe-line leading to the tanker became fractured and a quantity of liquid trickled into a burn which joined the River Teviot.

Chemical Engineering Course.—An advanced course in chemical engineering, leading to the award of the Diploma of Graduate Studies (Chemical Engineering) is available at the University of Birmingham to candidates who already hold an honours degree in chemical engineering, chemistry, physics or mechanical engineering. The purpose is to provide training to a standard higher than that of the normal under-graduate course. It is expected that entrants will have had practical experience in some branch of chemical engineering for a period of at least two years. The course will normally occupy one year, but graduates in chemistry, physics and mechanical engineering may require two years for completion.

SCOTTISH JUNIORS VISIT DUMBARTON

The Scottish Junior Gas Association (Western District) visited Dumbarton gasworks recently to inspect the new 6 mill. cu.ft. per day works which is being erected there. The group photograph we reproduce was taken on that occasion. In the centre of the front row (seated) sixth from left onwards are the following: W. Kirk, Secretary, Scottish Association of Gas Managers; D. F. Young, Divisional Controller, Glasgow; E. G. Smith, Deputy Divisional Controller, Glasgow; H. A. Aitken, Engineer and Manager, Leven; A. P. McInnes, Acting President of the Junior Association; A. W. Brown, Deputy Divisional Controller, Aberdeen and Senior Vice-President, Scottish Association of Gas Managers; A. McFadyen, Sub-Group Manager, Dumbarton Group; R. Simpson, Engineer and Manager, Denny; R. Currie, President of the Junior Association; W. A. Green, Secretary of the Junior Association; C. A. Poulson, West's Gas Improvement Co., Ltd.; and S. K. Patterson, Assistant Engineer and Manager, Dumbarton.

Organisation and Development in East Midlands

Mr. Sydney Smith Outlines Work in Progress and Future Plans

MR. SYDNEY SMITH, Chairman of the East Midlands Gas Board, presented to the East Midlands Gas Consultative Council on July 7 a report on the organisation and development of the area in which he reviewed administration, industrial relations, charges for gas, work in progress, plans for future development, projects of major importance approved during the year ended March 31, 1953, civil defence, and the efforts made by the Board and its staff for the improvement of supplies and of service to consumers generally. Under the heading of administration Mr. Smith said that for some time past the need had been felt for the creation of a technical section in the Commercial Manager's department, so that expert advice could be available to the Board on the appliances, fittings, and meters purchased for use on consumers' premises, and so that closer liaison could be maintained with the research laboratories of the industry and the research staffs of appliance manufacturers. This section, although at present very small, has now been established and the results so far obtained have been useful not only to consumers and the Board but also to manufacturers.

Mainlaying Progress

During the year approximately 240 miles of new mains of all sizes were laid, an increase of some 32 miles over the length laid in the previous year. The interlinking main between Nottingham and Newark has been completed and a partial supply of gas is being delivered from Nottingham. Following the installation of new compressors there, capable of handling the total quantities of gas required, the Newark works will be closed down. Work has proceeded on the branch of this main from Bingham to Bottesford and Grantham.

Mains from Wellingborough to Burton Latimer and from Newark to Southwell were completed, and the last-named works in each case was closed down on receiving supplies of gas in bulk.

Work commenced during the year on bulk supply mains from Doncaster to Thorne and from Derby to Ashbourne; and approval was given to the bulk supply of Woodhall Spa and Horncastle from Lincoln: mainlaying work on this project commenced in May, 1953.

Work has proceeded on a number of reinforcement mains. Load and pressure surveys of distribution systems have been continued, and a number of existing mains have been cleaned.

Excluding renewals, the number of new service pipes laid during the year was 21,102, an increase of about 3,000 over the number laid in the preceding year. This reflected the increase in building activity which, towards the end of 1952, strained the availability of both mains and service pipes to the limit. Fortunately, the number of completed houses awaiting supplies of gas did not assume major proportions; and an improvement in supplies of pipes during recent months, together with the transfer of stocks between undertakings, has led to a considerably improved position.

Improvements in the technical efficiency of production were well maintained. The average yield of gas per ton of coal carbonised, including the thermal value of benzole recovered, rose by 1.5 therms to 75.8 therms, representing a saving of approximately 34,000 tons of coal.

There was also a further marked improvement in the net yields of coke and breeze available for sale per ton of coal carbonised: coke rose from 7.1 cwt. to 7.4 cwt., and breeze rose from 0.9 cwt. to 1 cwt. Coke used for steam-raising fell by 21,000 tons in spite of an increase in the volume of gas made; while coke used in water gas generators fell by 1.38 lb. per 1,000 cu. ft. of gas made, equivalent to a saving of nearly 4,000 tons over the year.

Oil used per 1,000 cu. ft. of carburetted water gas made fell from 1.70 gal. to 1.63 gal., representing an economy of 385,000 gal. over the year, equivalent to over 4% of the total oil used.

Coke Oven Gas

Negotiations continued with the two divisional boards of the National Coal Board and with other owners of coke ovens in the area, relating to the purchase by the Board of gas from new coke oven plants under construction. Agreement was reached with the Stanton Ironworks Co., Ltd., on the price to be paid for large additional quantities of gas anticipated to be available in 1956; but negotiations are still proceeding on the price to be paid for gas expected to be available also in 1956 from the Avenue coke ovens of the East Midlands Division of the National Coal Board. Until agreement has been reached, arrangements to receive the gas cannot be made.

Discussions have been arranged to take place in the near future between the Board, the North Eastern Gas Board, and the North Eastern and East Midlands Divisional Boards of the National Coal Board on the co-ordination of future carbonisation developments.

The Board has seen no reason to alter its views on the broad lines of the future development of gas production and bulk distribution. These are regarded as sound, at least so long as present methods of gas production continue; but whereas the relative costs of production in the coalfield areas of the Sheffield and Rotherham and the Notts. and Derby Divisions are such as to render uneconomic the transmission of gas between these two divisions, the costs of production in the south of the area remote from the coalfields, that is, in the Leicester and Northants Division, are sufficiently above the costs of production in the coalfield areas to justify bulk transmission.

In Lincolnshire, where, except in one or two of the larger undertakings, costs of production are relatively high, the distances between towns are such that integration is possible only to a limited extent. Future developments in this Division are envisaged in the direction of the gradual concentration of production in seven or eight works, each supplying gas in bulk to the neighbouring smaller towns and villages.

Estimates of future gas requirements over the next ten years have been reviewed and compared with the estimates of gas expected to be available, both manufactured and bought. The quantities expected to be available within the boundaries of the Notts. and Derby Division are estimated to exceed the requirements of that Division during the summer months of the years 1956 to 1962 by something between 21 and 24 mill. cu. ft. per day; and it is apparent, in view of the relative costs of production, that useful economies can only be made by transmitting this surplus gas to the Leicester and Northants. Division. To do this would involve the complete integration of undertakings within that Division, and plans towards this end are under consideration.

The availability at Northampton of gas from the coalfield area of the Notts. and Derby Division will make unnecessary the new carbonising plant ordered for the Northampton works, and this contract, therefore, has been suspended. Similarly the more efficient use of gasholder storage capacity within the Leicester and Northants Division, which will be possible as a result of interlinking, will make unnecessary, at least for a number of years, the 1 mill. cu. ft. gasholder ordered for the Rushden undertaking, and this contract also has been suspended. The savings in capital expenditure on these two projects will be not less than £800,000 on the basis of current prices. In the light of these developments, the interconnection between the Sheffield and Rotherham and the Notts. and Derby Divisions has been temporarily deferred.

Difficulties with regard to the site for a new coke oven plant at Tinsley Park, Sheffield, have made necessary a survey of possible alternative sites, and hence the erection of the first battery of ovens, originally planned to be completed about 1956, has been deferred.

Service to Consumers

Dealing with service to consumers, Mr. Smith said the standard of showroom window displays has been improved during the year. Small portable units of attractive modern design have been made up from simple materials at the area display centre workshops at Syston for circulation to showrooms throughout the area, the component parts being carefully designed to enable them to be used repeatedly in the making of new units.

These and other efforts, designed to keep the public conversant with the goods and services which the Board can offer, have been made under the restrictions imposed on sales and publicity by national policy. In a period when a hardening of markets was noticeable, the general trader has been able to meet the situation by expanding publicity in ways denied to the Board. As a consequence, the Board has been at a great comparative disadvantage in bringing to the notice of the public the attractive equipment available in such important spheres as water heating, space heating, and refrigeration. It is the object and intention of the Board to continue its efforts to ensure that consumer service throughout the East Midlands shall be in accordance with the highest standards.

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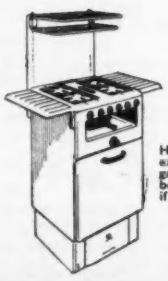

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Gas and Electricity

FRIENDLINESS IN THE EASTERN AREA

FRIENDLY relations exist between the electricity and gas consultative councils in the Eastern area. Alderman R. Turner, Chairman of the Gas Consultative Council, recently addressed the Electricity Consultative Council, and he announced at a meeting of his Council on July 20 that his opposite number, Alderman Bennett, was to return the compliment by addressing the Gas Consultative Council next January. He would have come to the November meeting but for the fact that that meeting has already been earmarked for an address by Sir John Stephenson on the report and accounts of the Eastern Gas Board for the year ended last March.

Alderman Turner reported that at the periodical meeting of the Minister of Fuel and Power with the chairmen of the 12 gas consultative councils one of the main topics for discussion was the report of the Fabian Society on suggestions for increasing the usefulness of the consultative councils in the nationalised industries. The chairmen were almost unanimous in the view that the councils should meet away from gas board premises. The report had suggested a research body to aid the councils; the meeting had expressed the opinion that such a research body might comprise economists and accountants rather than technicians, and the idea was generally welcomed.

Reports were received from all the five divisional committees. A meeting of the Cambridge committee had been preceded by visits to the works of Baker Perkins, Ltd., and the Co-operative Bakery at Peterborough. At the former the committee learned with concern that whereas the majority of bread-baking ovens produced used to be gas-fired they were now almost 100% oil-fired, the reason being the high price of gas. It was also learned that bakers with existing gas-fired ovens were gradually changing over to oil.

At the Co-operative Bakery the members learned that the gas-fired oven consumed 1,200 to 1,300 therms per week, working non-stop for 24 hours per day. The total annual consumption was about 676,000 therms. The management of the bakery was concerned at the high price of gas in that it did not now compete with oil, which worked out a little over half the cost of gas. For that reason a new oven now being erected, with a capacity one and a half times the present plant, was to be oil-fired. The committee understood that the existing oven could easily be converted to oil-firing, and with the price of gas at 1s. 2¼d. per therm for bread baking there was every possibility of that taking place when the present agreement was concluded.

Church heating had also engaged the attention of the Cambridge committee. A church at Bedford was centrally heated by two gas boilers with a 'full on' consumption of about five therms, costing 8s. 4d. an hour. As an alternative 14 luminous panel heaters could be installed at an estimated capital cost of £300, and 'full on' they would consume 3½ therms, costing 5s. 5d. per hour. An added advantage would be that for small congregations it would be possible to heat only a part of the church. Economies carried out following instructions to the caretaker, however, had resulted in a reduced consumption and provided the economies were perpetuated the Vicar was in favour of continuing with the present heating system.

The Norwich committee minutes recorded that a member had reported that at her house she had three water heaters and these were maintained by three separate men on three different dates. She had asked the men on several occasions why the three appliances could not be dealt with at the same time, and was told that they were due to be serviced on different dates based on the date of fixing. The committee commented: 'Surely a great saving would be effected if it could be arranged for these appliances to be serviced at the same time.'

Coke had been the main topic at a meeting of the Watford committee. A Hemel Hempstead member, Councillor Morris, had criticised a poster exhibited in the local showroom inviting people to register with the Board for their supplies of coke and promising 'prompt delivery.' He felt there was undue delay in delivery at Hemel Hempstead because coke orders, delivery tickets, etc., were dealt with centrally at divisional headquarters at Watford. The Board had stated that it was the transport and loading facilities that determined the speed at which orders were executed, and not the necessary paper work.

After the Board had reported that Councillor Morris had had two recent deliveries within three days of ordering, 'without any special steps to expedite the orders,' he revealed that he was in fact a priority consumer, having handed a medical certificate concerning his wife's health to the local fuel overseer. His real point was that a growing town like Hemel Hempstead should have its own coke administration. The Board's answer to that was that centralisation led to improved efficiency with no loss of time, and that Hemel Hempstead consumers were so satisfied with present arrangements that when opportunity was given to change suppliers 95 new coke consumers registered with the Board and only 17 transferred elsewhere.

From Welwyn Garden City came a complaint about coke quality and a suggestion that the price of coke should be related to its thermal value. The Chairman had replied that it was impossible to relate price to thermal value, for although tests for ash content and other matters could be made on samples taken from bulk supply there could be no guarantee that any particular delivery would be the same as the sample.

Attention had been drawn to the publication in the baking industry Press of articles about the cost of gas and recommending bakers to change to solid fuel or oil. The Watford committee thought there was only one answer to this problem, and one that would have to be decided in the near future, and that was a national fuel policy. It was suggested that the support of the Electricity Consultative Council on this important question might be obtained.

Scottish Gas Board Projects

THE erection of a new 2 mill. cu. ft. gasholder at Midmill Site, Dundee, at an estimated cost of £145,000, and a £230,000 vertical retort installation at Dumfries, are among new projects which have been approved by the Scottish Gas Board during the past three months, involving a total expenditure of £1,069,619.

Details of the schemes were submitted at a meeting of the Scottish Gas Consultative Council at Edinburgh on July 8, when the divisional figures were reported as follows: South East Division, £5,350; Central Division, £496,571 (Perth Group, £228,923; Fife Group, £12,648; Dundee Group, £225,000); Northern Division, £27,045; Glasgow Division, £98,830; Lanarkshire and South West Division, £441,823 (Lanarkshire, £125,347; Kilmarnock Group, £299,497; Western Group, £16,979).

The Dumfries vertical retort installation is the largest single project on the list. Twelve retorts with coal and coke handling plant and retort house and foundations for 16 retorts are included in the £230,000 scheme. It is not expected that a start will be made with the work before next year.

The Dundee gasholder will be delayed a year beyond that, but another Dundee scheme—the provision of new workshop, works, distribution stores, and other accommodation at an estimated cost of £110,000—will receive an earlier start.

The installation of an additional 3 mill. cu. ft. per day set of purifiers for Stirling will cost an estimated total of £90,000, and about £50,000 is to be spent on the provision of bulk supply to Dunblane and Doune from Stirling. The main to be laid will be large enough to supply Callander at some future date.

Glasgow's main items are £46,546 for the provision of mains and services to supply the Drumchapel housing scheme, and £11,300 for laying a new 18-in. high pressure main to improve pressure in the south side of the city. No schemes are reported from Edinburgh. The renewal of the No. 1 gasholder at Fraserburgh, estimated to cost £17,500, is the largest project approved in the Northern Division.

Mr. A. T. Morrison, Aberdeen, who presided at the Edinburgh meeting, said the position had perhaps been overstated by the North Western Council, but, unfortunately, the Ministry had reacted rather against gas in fixing coal prices. The price of gas coal had been increased out of proportion to other coal on the basis that if gasworks wanted the better quality of coal they had to pay more for it. The Gas Council took this matter up and protested most strongly.

Councillor R. West Russell, referring to the latest changes in coal prices, asked if the cheaper grades would give a fillip to the industry.

Mr. Morrison said that he had made enquiries as to whether the price increases and reductions were going to affect gasworks, and he had been told they were not. If they could use grades eight or nine or thereabouts they might save something. 'There is more efficiency,' he added, 'in burning coal for gas than anything else.'

Mr. Nabarro on Fuel Needs

MR. GERALD NABARRO, M.P., Joint Secretary of the Conservative Parliamentary Fuel and Power Committee, put forward a three-point plan to avert a fuel crisis next winter when speaking to a meeting of the National Federation of Co-operative Coal Managers' Associations at Loughborough. He suggested that the Government should at once de-ration coke, which is plentiful, or at least double the household coke allowance. Every briquetting plant, many of which are idle, should be worked at maximum capacity to make low grade fuel suitable for use as household ovoids. All available house coal should be rushed to the merchants, and householders should again be urged to increase their stocks as early as possible. Without such energetic action, Mr. Nabarro said, if the winter was severe we might well face a disaster comparable with that of 1947.

Royal Visit

WHEN the Queen visited Caernarvon Castle on July 10 many prominent people from the counties of Caernarvon, Anglesey, and Merioneth were presented to Her Majesty and the Duke of Edinburgh. The list of presentations included four representative workers, one each from agriculture, slate quarrying, building trades, and local industries. Each industrial concern in Caernarvon was asked to submit a name, and Mr. Robert Thomas, an employee at the Caernarvon gasworks of the Wales Gas Board, was successful in a draw of 19 names from a hat.

Mr. Thomas is 66 years of age and has been employed by the Caernarvon gas undertaking as a bricklayer since July, 1944. His duties cover repairs to horizontal retorts and furnaces, brickwork lining repairs to the water gas plant and Tully complete gasification plant, and general building repairs. During the presentation the Duke asked Mr. Thomas several questions about his work in the gas industry.

Northern Sports Meeting

THE THIRD annual sports meeting of the Middlesbrough Division of the Northern Gas Board was held at Redcar. This meeting is organised entirely by the employees from the sports clubs attached to each unit of the Middlesbrough Division. It continues to be the only event of its kind held in the area of the Northern Gas Board.

About 450 employees and their wives and children attended the meeting, which consisted of 28 athletic field events of all kinds. The prizes were presented by Mr. J. R. Bradshaw, Deputy Chairman of the Northern Gas Board, and Mrs. Bradshaw; also present were Mr. John W. Pallister, Divisional General Manager, and Mrs. Pallister, Mr. L. A. Garratt, Industrial Relations Office, and Mrs. Garratt, Mr. Bunting, Chief Accountant, and Mrs. Bunting, Mr. and Mrs. Croft, and Mr. and Mrs. Field.

The Pallister Cup awarded annually to the Unit having the largest number of points in the field events was won by the Middlesbrough Unit.

SUNDERLAND EXTENSIONS

MR. W. O. KIRKWOOD, General Manager of the Sunderland Division of the Northern Gas Board, announced at a meeting of the Sunderland Divisional Consumer Committee that work will begin during the next few months on the foundations of a new automatic carburetted water gas plant with a capacity of 3 mill. cu. ft. per day at the Hendon works, Sunderland. A new 2½ mill. cu. ft. capacity gasholder was recently brought into commission at Hendon, and the addition of the new plant, which is due to be ready for the winter of 1954-55, will increase the productive capacity of the works to 11½ mill. cu. ft. It is being constructed to meet the increasing demand for gas in the Sunderland area.

Mr. Kirkwood reported that new ancillary plant at the Hendon works, including ammonia recovery, electro-static detarrer for the removal of tar, and Connersville meter was now in operation. Reconditioning of ten beds of horizontal retorts at the Hendon works had progressed satisfactorily, and during the coming winter the whole of this plant would be available for the manufacture of coal gas, thereby increasing the productive capacity of the works.

The new gas compressors, 150,000 cu. ft. per hour capacity, which had been housed in a new building, were now in commission at Hendon, thereby providing additional plant for the transference of gas between the Hendon and Ayre's Quay works and also augmenting the high pressure gas supply to the outlying districts of Sunderland.

Mr. Kirkwood said that the erection of the steel tank and floating portion of a new gasholder with 250,000 cu. ft. capacity, was to begin soon at Washington, County Durham, and should be available for district use early in 1954.

Turning to improvements in distribution, Mr. Kirkwood said that a main was now being laid to Sunderland Corporation's seventh post-war housing estate at Castletown. It was due to be completed by the end of September. The Board had also approved the laying of a 12 in. diameter high pressure main from the Ayre's Quay works to Fulwell Mill for the augmentation of pressures on the north side of the River Wear within Sunderland's borough boundary. This main would form an integral part of the Board's larger schemes for interdivisional linkage between the Sunderland and Newcastle Divisions.

Industrial Relations Officer Visits B.G.S.A. Branch

MR. P. VALON BENNETT, Industrial Relations Officer to the Southern Gas Board, speaking at Portsmouth on July 6, repudiated a suggestion that his Board tended to frown on employees who were active members of recognised staff organisations.

Mr. Bennett, who had been invited to attend one of the regular monthly meetings of the Portsmouth Branch of the British Gas Staff Association, said that the Board was most anxious to foster the team spirit and stressed the importance of effective machinery for joint consultation at all levels.

Mr. J. H. Corrigan, Southern Area Organiser of the B.G.S.A., endorsed Mr. Bennett's comments in this connection and urged, in particular, that the fullest possible use be made of the local consultative committees which had been established in the area.

The Branch Chairman, Mr. W. J. Osborne, himself a member of the Area Joint Council, expressed appreciation of Mr. Valon Bennett's visit, and pleasure at seeing Mr. H. M. Lawrence, Engineer and General Manager of the Portsmouth undertaking and his Assistant, Mr. Rich, among the visitors.

COMPANY NEWS

CANNON (GA) LTD.

Cannon (Holdings) Ltd., announces that the name of the company has now been changed to Cannon (GA) Ltd.

COLONIAL GAS ASSOCIATION

Further details are now available in connection with transfer of control of Colonial Gas Association to a new Australian holding company, as reported in the *Journal* on July 22. Shareholders are to be offered an exchange of shares on the basis of four fully paid 6% cumulative preference shares of £1 each in the new holding company for every three 8% non-cumulative preference shares in the Association, and five fully paid ordinary of £1 each in the holding company for every four ordinary in the Association.

GEO. W. KING

Gross profits of Geo. W. King, Ltd., for the calendar year 1952 were £43,000 up at £196,000, but the excess profits levy provision was £21,000 and the aggregate tax charge was £52,000 higher at £138,000, so that net profit was actually £9,000 lower on the year.

The company is able to pay its customary dividend of 12½%, this time on a capital increased by the July, 1952, scrip issue of nearly 31%. The chairman's forecast is thus fulfilled.

UNITED GAS INDUSTRIES

A final ordinary dividend of 12% is proposed by United Gas Industries, making a total of 17% for the year ended March 31, 1953. Group net profit was £182,695, compared with £215,405 in the previous year.

INCANDESCENT HEAT COMPANY

Consolidated trading profit of the Incandescent Heat Co., Ltd., for the year to December 31, 1952, was £58,923 (against £69,055). Deduct depreciation £8,571 (£7,148), auditors' remuneration £770 (same) and tax £37,723 (£35,990), leaving net profit £11,859 (£25,147). Add £2,000 (nil) from tax reserve. To outside interests £9,405 (£6,374). Ordinary dividend 10% (same), forward £78,025 (£70,915). Group current assets £417,279 (£394,796), including stocks £42,238 (£49,367), work in progress £97,144 (£87,569), debtors and advance payments £216,298 (£200,430), and cash £61,293 (£57,146). Current liabilities and provisions £411,646 (£378,472), including creditors and accrued charges £359,276 (£26,034).

HUWOOD CONVEYORS

reduce coke storing charges

Illustration shows Huwood Top-Belt Conveyor stacking coke at the Howdon Works of the Northern Gas Board.

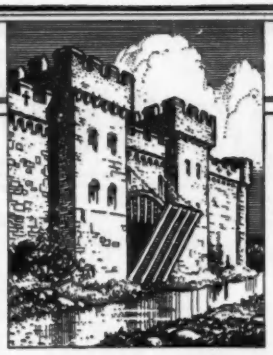
Huwood Conveyors can be designed to suit any individual requirements

Head Office and Factories: **HUGH WOOD & CO. LTD., GATESHEAD-ON-TYNE, 11**

TELEGRAMS: HUWOOD, GATESHEAD TELEPHONE: LOW FELL 76083 (6 LINES)

Industrial and Export Office: **Hugh Wood & Co. Ltd.,** Dashwood House, 69 Old Broad St., London, E.C.2

TELEGRAMS: HUWOOD, AVE, LONDON TELEPHONE: LONdon Wall 6631-2-3 (3 LINES)



PROTECTION

GAUNTLET

GAUNTLET

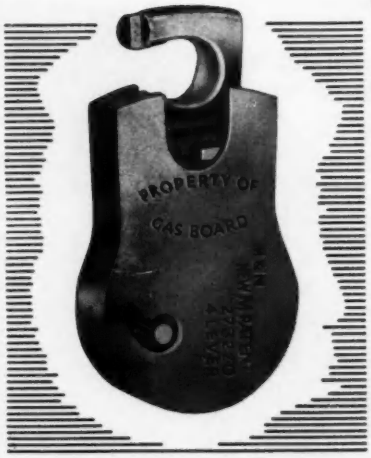
WEATHER TESTED PAINTS

ARCHD H. HAMILTON & CO. LTD

27-37 BARDOWIE STREET POSSILPARK GLASGOW.N

M & M PATENT METER LOCKS

use the STRONGEST, SAFEST METER LOCK



- DON'T buy locks you may have to scrap in a few years
- DON'T look only at the initial cost
- DON'T think only of the present time; look to the future
- DO remember that good quality is cheapest in the long run
- DO take our word for it that our workmanship is consistently good
- DO profit by others' experience and use M. & M. Locks to protect your meter

H. MITCHELL & CO.

36, 38, NEW CHARLES STREET, LONDON, E.C.1

Plenty to Spare...

During the past few months, considerable re-organisation of our works has taken place; production is planned on an entirely new basis, with the result that output is increasing. This is particularly so with fittings, and deliveries can be made from stock as shown.

Your orders will be dealt with promptly and efficiently

BARREL NIPPLES. Full range of sizes from ⅛in. to 6in. Black or galvanised.

No 23

RUSSELL BROS (WALSALL) LIMITED

BRADFORD TUBE WORKS · WALSALL

TRADE MARK

WESTWOOD & WRIGHTS

LIMITED

BRIERLEY HILL, STAFFS.

GASHOLDERS · PURIFIERS · WASHERS
CONDENSERS · CASTINGS · STEELWORK
GAS VALVES · WELDED PIPES

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price **1/3d.**; by post **1/5d.**

Subscription Rates: Home and Empire:—**52/-** per annum; Foreign:—**60/-** per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at **1/9** per line (approx. **7** words)—minimum charge **10/6**. A Box Number address occupies **2** lines, and a further **6d.** is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received **14** days prior to publication if proofs are required. Type area of inside pages **10**" deep × 7" wide; block screen **120**.

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS OFFICE: 10, Union Street, Birmingham.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. *'Phone:* Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. *Telegrams:* Gasking, Fleet, London.

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DUTCH AND DANISH BOG ORE
SPECIALLY ACTIVATED OXIDE OE IRON

Oxide supplied on loan or sale outright.
Highest prices paid for Spent Oxide.

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ESTABLISHED 1873

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legrams: "urification, Stock, London." Telephone: London Wall 5077

PRESSURE VESSELS
FOR THE GAS AND CHEMICAL INDUSTRIES
Welding in all Metals (Gas or Electric)
Welding Repairs

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Richmond Road, BRADFORD
Tel. : BRADFORD 25405

"KLEENOFF" *
THE COOKER CLEANER

"KLEENOFF"
FIBRE BRUSHES
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"KAY-DEE" *
KETTLE DESCALER

esale to the public, and in bulk for Works use.

ALE & CHURCH, LTD.
CRAWLEY, SUSSEX.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18–64 inclusive or a woman aged 18–59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

WEST MIDLANDS GAS BOARD

SHROPSHIRE DIVISION

DISTRIBUTION SUPERINTENDENT—SHREWSBURY DISTRICT

THE SALARY for the post will be within Grade VIII (£585-£665 per annum) of the National Salary Scales for Gas Staffs.

Candidates should be experienced in mainlaying practice, capable of preparing estimates and specifications, and supervising Contractors work on both high and low pressure systems. The responsibilities also include the general administration of the gas Distribution Department, Showroom and Sales and Service organisation.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, personal details, qualifications and experience, should be addressed to Mr. C. M. D. Belton, Divisional General Manager, West Midlands Gas Board, Shropshire Division, Sidney House, School Court, Shrewsbury, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON & DISTRICT DIVISION

STOURBRIDGE GROUP

WORKS ENGINEERS AND MANAGERS

APPLICATIONS are invited from suitably qualified gas engineers for the position of WORKS ENGINEER AND MANAGER at three of the works comprising the group.

Applicants must have had experience in the control and management of works of comparable size, and the successful candidates will be responsible to the Group Works Engineer and Manager for the day-to-day operation and maintenance of the works to which they are appointed. They may also be required to assist in the general duties of the group and to take emergency duty at any of the works comprising it.

The posts are at :

Stourbridge—at a salary of £1,200 per annum.
Cradley Heath—at a salary of £1,000 per annum.
Rowley Regis—at a salary in accordance with Grade XII (£740-£865 per annum).

The posts are pensionable and the successful applicants may be required to pass a medical examination.

Applications, stating the post to which they refer, and giving details of age, training, experience and the names of two referees must be received within fifteen days of the appearance of this advertisement by the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

NORTH STAFFORDSHIRE DIVISION

STAFFORD DISTRICT

WORKS CHEMIST

APPLICATIONS are invited from suitably qualified persons for the above post.

Candidates should hold the Intermediate B.Sc. (Chemistry), or equivalent, as a minimum qualification, and should have had a comprehensive training and experience in all aspects of chemical control of gas works plant and processes.

The salary will be within Grade VI (£490-£570 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, giving details of age, qualifications and experience, together with the names of two referees, should be addressed to Mr. J. E. Stanier, Divisional General Manager, West Midlands Gas Board, Etruria Gas Works, Stoke-on-Trent, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

NORTHERN GAS BOARD

STOCKTON DIVISION

TECHNICAL ASSISTANT—CARBONISATION

APPLICATIONS are invited for the above position with the Stockton-on-Tees Undertaking. Duties will consist mainly of the supervision of a new 4 million per day Vertical Retort Installation and existing Horizontal Carbonising Plant. Experience with vertical retorts, preferably of West's construction, is essential.

Salary within the range of Grade IX (£615/715) of the National Salary Scales.

The post is pensionable and the successful candidate will be required to pass a medical examination.

Applications stating age, qualifications and experience, together with the names of two referees, should reach the undersigned not later than Tuesday, August 11, 1953.

F. L. SCAIFE,
Divisional General Manager.

Gas Works,
Thompson Street,
Stockton-on-Tees.

SCOTTISH GAS BOARD

SOUTH EAST DIVISION

GALASHIELS DISTRICT

APPLICATIONS are invited for the post of ASSISTANT MANAGER, Galashiels. Candidates should have a comprehensive knowledge of modern methods of gas manufacture and distribution and must possess appropriate recognised technical qualifications. Some administrative experience would be an advantage.

The salary will be A.P.T. VII (£545-£625) with initial placing according to qualifications and experience. The successful candidate will be required to pass a medical examination, and to subscribe to the Board's Staff Pension Scheme. A house will be available at reasonable rent.

Applications, addressed to the undersigned, should furnish details of qualifications and experience and reach the undernoted address not later than August 22, 1953.

D. J. COLVIN,
Divisional Controller.

25, Chester Street,
Edinburgh, 3.

(*Classified advertisements continued on page* 302)

APPOINTMENTS VACANT (ctd.)

THE N.V. Overzeese Gas—en Electriciteitmaatschappij heemraadssingel 226, Rotterdam—C., Holland.

Requires for sending out to Indonesia, an EXPERIENCED OVEN BUILDER acquainted with the building of vertical chamber ovens.

Written applications to the above address.

NORTH WESTERN GAS BOARD

MANCHESTER GROUP

APPLICATIONS are invited for the following pensionable appointments :—

DRAUGHTSMAN,
DISTRIBUTING DEPARTMENT
(Salary within Grade A.P.T. VII, £545-£625 per annum)

Applicants should have a knowledge of the design and layout of distributing plant, including boosting and governor systems and the maintenance of plan records. They should possess the Higher National Certificate of the Institution of Mechanical Engineers, or hold a similar qualification.

HOUSING INSTALLATIONS REPRESENTATIVE
(Salary within Grade A.P.T.VII, £545-£625 per annum)

The successful applicant must be fully conversant with installation practice and be capable of interviewing at executive level. He will act as liaison officer between the Group, Local Authority Housing Departments and the Ministry of Works and must be capable of advising on installation work, estimating and supervising installation.

Detailed applications endorsed "Draughtsman" or "Housing Installations Representative" together with the names of two referees should reach the General Manager, North Western Gas Board (Manchester Group), Town Hall, Manchester, 2, within fourteen days.

EAST MIDLANDS GAS BOARD

SHEFFIELD & ROTHERHAM DIVISION
SENIOR TECHNICAL ASSISTANT

APPLICATIONS are invited from suitably qualified persons for the above appointment in the Divisional Mains Engineer's Department, Sheffield, at a salary in accordance with Grade A.P.T. VII of the National Salary Scales for Gas Staffs, up to a maximum of £625 per annum. The initial placing on the grade will be dependent upon the qualifications, experience and ability of the successful candidate.

Applicants should have had some practical experience in mains and service work generally and have considerable knowledge of the design of distribution systems, together with experience in the estimation of costs. Preference will be given to candidates possessing a recognised technical qualification.

The post is superannuable and the successful candidate will be required to pass a medical examination and, unless already subject to a pension scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications, stating age and giving details of qualifications and experience, together with the names of two referees, should be addressed to reach the undersigned not later than August 10, 1953.

C. C. WOOD,
Divisional General Manager.

Gas Offices,
Commercial Street,
Sheffield, 1.
July 21, 1953.

SOUTHERN GAS BOARD

WESTERN DIVISION

APPLICATIONS are invited for the position of GENERAL ENGINEERING DRAUGHTSMAN at the Poole Works of the Bournemouth Undertaking.

Applicants should have a good knowledge of general engineering drawing, and workshop training is essential. A knowledge of Gas Works Plants will be an advantage.

The salary will be in accordance with A.P.T. IV (Provincial 'A') of the National Joint Council for Gas Staff, *i.e.* £305 to £495 per annum.

The successful applicant will be required to undergo a medical examination and also to join the Southern Gas Board Pension Scheme.

Applications giving full particulars of age, training, experience and qualifications, together with the names of two referees, to be submitted to the undersigned on or before August 15, 1953.

J. C. HOGG,
General Manager.

Bournemouth Gas Undertaking.
136, Old Christchurch Road,
Bournemouth.

WALES GAS BOARD

MECHANICAL ENGINEER

APPLICATIONS are invited for the appointment of MECHANICAL ENGINEER to the Wales Gas Board.

The appointment is a responsible one, and the wide variety of mechanical engineering, gas holder and power problems encountered, render the work of great interest to a qualified and experienced Mechanical Engineer.

The Mechanical Engineer will control a staff of some 30 Mechanical Fitters and Erectors engaged in installing, dismantling and in repairing all types of Gas Works' plant throughout the Board's area. The economics of various forms of power and methods of gas holder repairs are of particular relevance.

The salary will be in the region of £1,100 to £1,200 per annum in accordance with qualifications and experience.

The successful candidate will be required to pass a medical examination and to join the Board's Superannuation Scheme.

ENGINEER AND MANAGER—
DENBIGH UNDERTAKING

Applications are invited for the position of ENGINEER AND MANAGER of the above Undertaking, within the Staff Salary Scale A.P.T. XB (£650/750 per annum) inclusive of emoluments. A house will be available.

Applicants should possess sound experience in all branches of gas manufacture and distribution, including the control and operation of continuous vertical retorts and the development of gas sales.

Ability to carry out the administrative and other duties of the post will be a necessary qualification.

The successful candidate will be required to pass a medical examination and to join the Board's Superannuation Scheme.

MANAGER—
LLANDOVERY UNDERTAKING

Applications are invited for the position of MANAGER of the above undertaking within the Staff Salary Scale A.P.T. VIB (£475/555 per annum) inclusive of emoluments. A house will be available.

Applicants should possess sound experience in gas manufacture and distribution and be capable of carrying out successfully the administration and other duties of the post.

The successful applicant will be required to pass a medical examination and join the Board's Superannuation scheme.

Applications for the above three appointments, giving age, qualifications, present position and experience, together with the names of two referees, should reach the undersigned not later than August 8, 1953.

C. B. MAWER,
Secretary to the Board.

2, Windsor Place,
Cardiff.

APPOINTMENT WANTED

COKE OVEN MANAGER AND ENGINEER, with Gas Works Superintendent experience, covering construction of all new plant, re-erection of all old plant, retort settings and ironwork, and maintenance (both electrical and mechanical). Vast workshop experience of all manufacturing problems. Salary matter of first importance. Age 47 years.—Box No. 157, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

PATENTS

KINGS PATENT AGENCY, LTD.
(Director, B. T. King, A.I.M.E., Patent Agent)
Advice, Handbook, and Consultations free. 146a, Queen Victoria Street, London, E.C.4. 'Phone: City 6161.

MISCELLANEOUS

MOISTURE TESTING for coal, coke and ash and many chemicals. Modern method in 'SPEEDY' MOISTURE TESTER giving accurate percentage water in 2/3 minutes. Already in use extensively in Gas Industry. Needs no electricity. Portable, simple for use by unskilled labour. Write for illustrated brochure, or order direct, £24 10s. 0d. complete—Thos. Ashworth & Co., Ltd. (Dept. G.J.), Basket Street, Burnley, Lancs.

FIRE! QUICK!
WHERE'S YOUR
NU-SWIFT?
The World's fastest and most reliable Fire Extinguishers
Pressure-operated by sealed CO_2 Charges
NU-SWIFT LTD · ELLAND · YORKS
In Every Ship of the Royal Navy

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direct to the actual smelters
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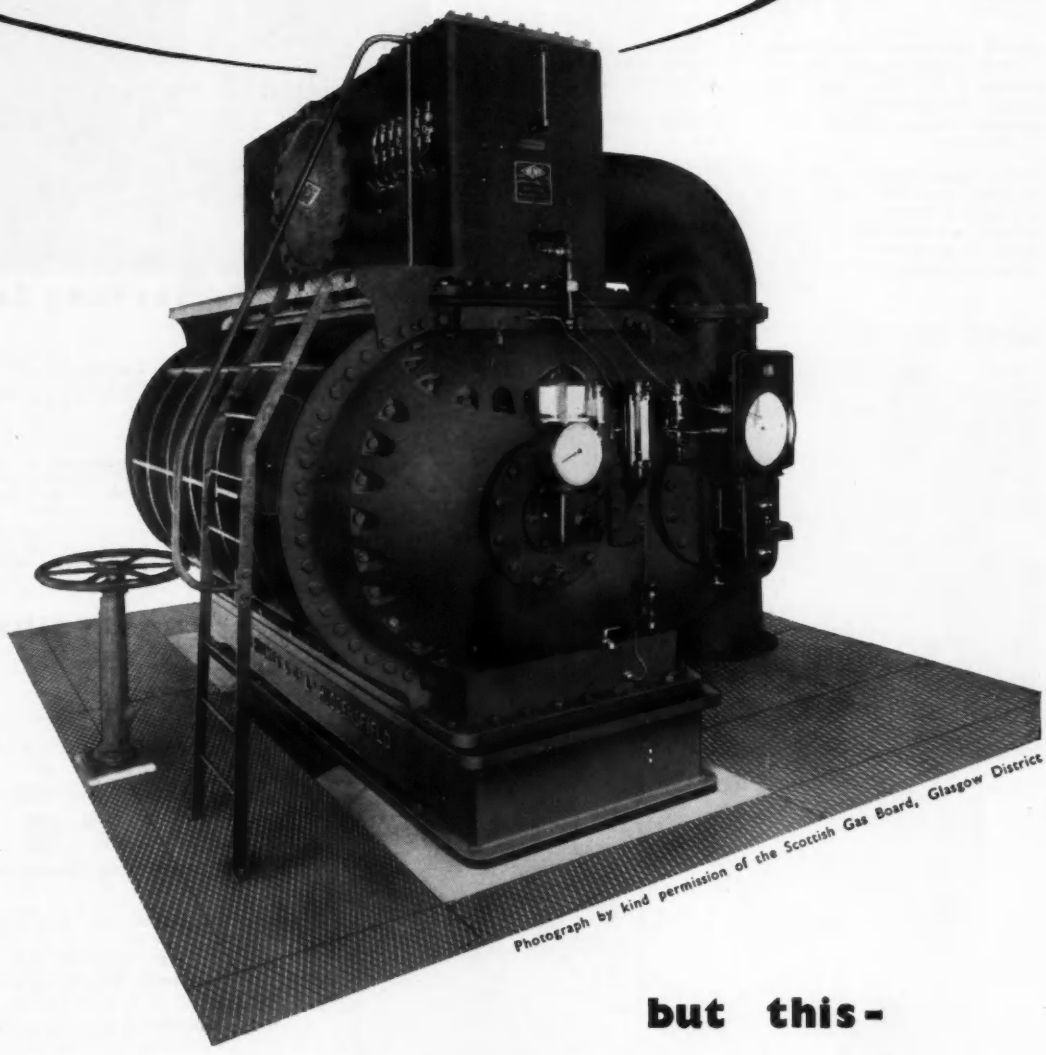
size isn't everything-



Photograph by kind permission of the Scottish Gas Board, Glasgow District

but this-

HOLMES-CONNERSVILLE
***Positive* GAS METER**

is the largest in Great Britain. The important thing is that it is so relatively small (floor space 8ft. × 14ft.) handling 31 million cu. ft. of gas per day.

FOUNDED 1850 HOLMES HUDDERSFIELD

W. C. HOLMES & CO. LTD. · HUDDERSFIELD · LONDON · BIRMINGHAM

Telephones: Huddersfield 5280; London Victoria 9971; Birmingham Midland 6830

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industrial gas compressors

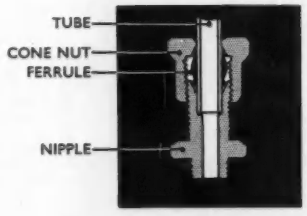
FOR COMPRESSING AIR OR GAS SUPPLIES USED FOR FURNACE HEATING, METAL MELTING, BRAZING, SOLDERING BITS, LAUNDRY IRONS, ETC.

DIRECT COUPLED COMPRESSORS (see illustration right) are fitted with automatic internal by-pass valves and lubrication systems. They are direct coupled to Keith Blackman motors. Type OA compressors in this range occupy a floor space of only 18" x 7½".
CAPACITY RANGE: 100 to 750 cub. ft. of gas or air per hour at 3 lbs. per sq. in. pressure.

TYPE 4 COMPRESSORS (not illustrated) are also fitted with automatic internal by-pass valves and lubricators. The complete unit includes motor and drive on a common bedplate, all of Keith Blackman manufacture.
CAPACITY RANGE: 500 to 20,000 cub. ft. of gas or air per hour at 3-5 lbs. per sq. in. pressure.
AREA OCCUPIED: from 9¼" x 16½" to 61" x 27".

DID YOU KNOW?

KEITH BLACKMAN have been making compression joints for many years and the present design embodies features developed as a result of this long experience. Notice that the shape of the ferrule is such that the joint is made without unduly stressing the tube.



serving to burn

Note: the four burner heads (right) are for high pressure gas, or low pressure gas and air blast.

LEFT: "Fishtail" type burner with two-armed stamped pattern injector for heating liquid in tanks by submerged combustion tubes. For use with low pressure gas supplies. **Size Range:** 1", 1¼", 1½", 2" and 2½" outlets. **Capacity Range:** 45-280 cub. ft. of gas per hour.

Brass non-blow-off head types: deal with 5 to 10 cub. ft. of gas per hour.

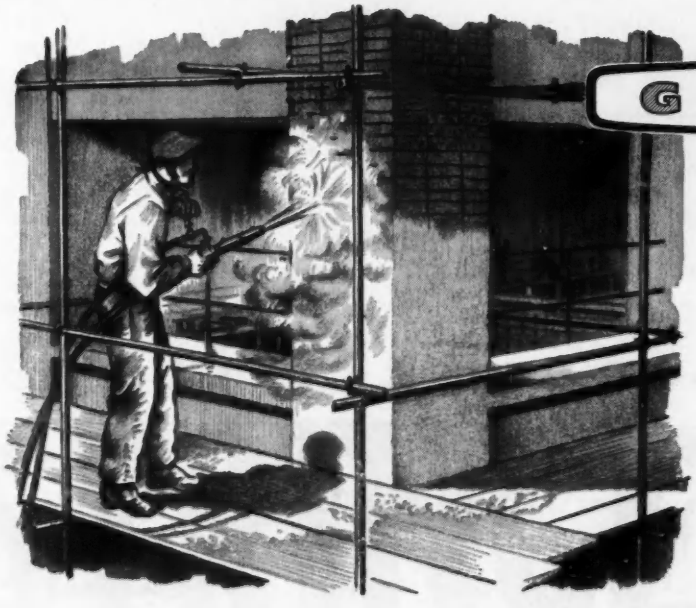
Stainless steel, "F" type head, burner: deals with 8 cub. ft. of gas per hour.

Perforated head type burner: deals with 10 to 15 cub. ft. of gas per hour.

Keith Blackman LIMITED
MILL MEAD ROAD, TOTTENHAM, LONDON, N.17
'Phone: Tottenham 4522 (twelve lines) 'Grams: "Keithblac, Norphone, London."
BRANCH OFFICES AT MANCHESTER, BIRMINGHAM, LEEDS, GLASGOW, NEWCASTLE-ON-TYNE, PENARTH near CARDIFF AND BELFAST

INDUSTRIAL GAS EQUIPMENT

524



GUNITE

The successful way to recondition defective concrete structures, encase structural steelwork, and line tunnels and water reservoirs. Developed and applied in all parts of the world with the resources, experience and skill of The Cementation Company, Ltd.

BY THE **CEMENTATION** *Company Limited*

BENTLEY WORKS · DONCASTER · Tel. DON. 54177-8-9

Registered as a Newspaper. Printed by STRAKER BROTHERS LTD., E.C.2, for WALTER KING, LIMITED, 11, BOLT COURT, FLEET ST., LONDON, E.C.4. Wednesday, July 29, 1953

What's in a Name..?

In this case something worth noting. Continuous research, carried out on our own full-scale gas works; testing gas-making coals, studying problems of retort and setting construction, checking materials used on Glover-West installations, designing new equipment to increase retort house efficiency. A progressive approach to the job of producing efficient carbonisation plant. We are not static. Our aim, in a word, is improvement.

West's Gas

IMPROVEMENT COMPANY LIMITED

ALBION IRONWORKS · MILES PLATTING · MANCHESTER 10

Telephone: COLlyhurst 2961 Telegrams: Stoker, Manchester

ndon Office: Columbia House, Aldwych, W.C.2. Telephone: HOLborn 4108-9 Telegrams: Wesgasco, Estrand

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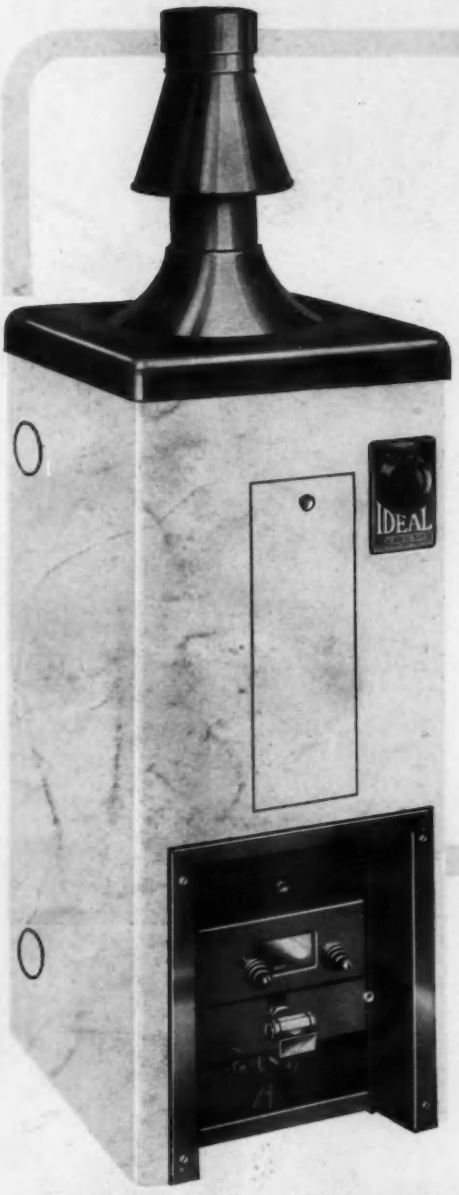


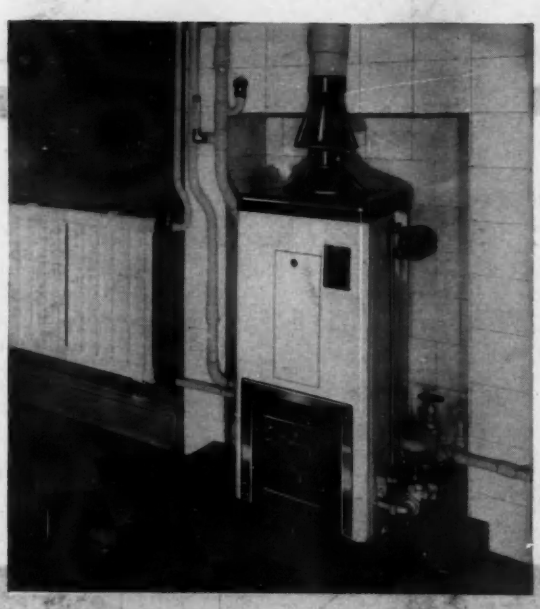
This illustrates the No. 1-GBB Series Boiler with cream and black stove-enamelled jacket, available in six sizes from 26,000 to 142,000 B.T.U. per hour. The interior shows a No. 1-GBB-3 Boiler situated in a private residence.

For efficient and lasting service...

To burn gas efficiently for the production of hot water, either for domestic purposes or central heating, demands a Boiler specially designed for the purpose. Over a period of 20 years we have developed a series of Boilers, each of which is unequalled in its particular field.

All Boilers are equipped with a complete set of thermostatic controls, and have insulated jackets of steel or aluminium in appropriate finishes. 'Ideal' Gas Boilers, of which several thousands a year are being installed, are available in 22 sizes from 20,000 to 1,430,000 B.T.U. per hour.

An illustrated booklet giving full details is available on request.



IDEAL GAS BOILERS

EFFICIENT · RELIABLE · LABOUR SAVING

IDEAL BOILERS & RADIATORS LTD

IDEAL WORKS · HULL

IDEAL-Standard